This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

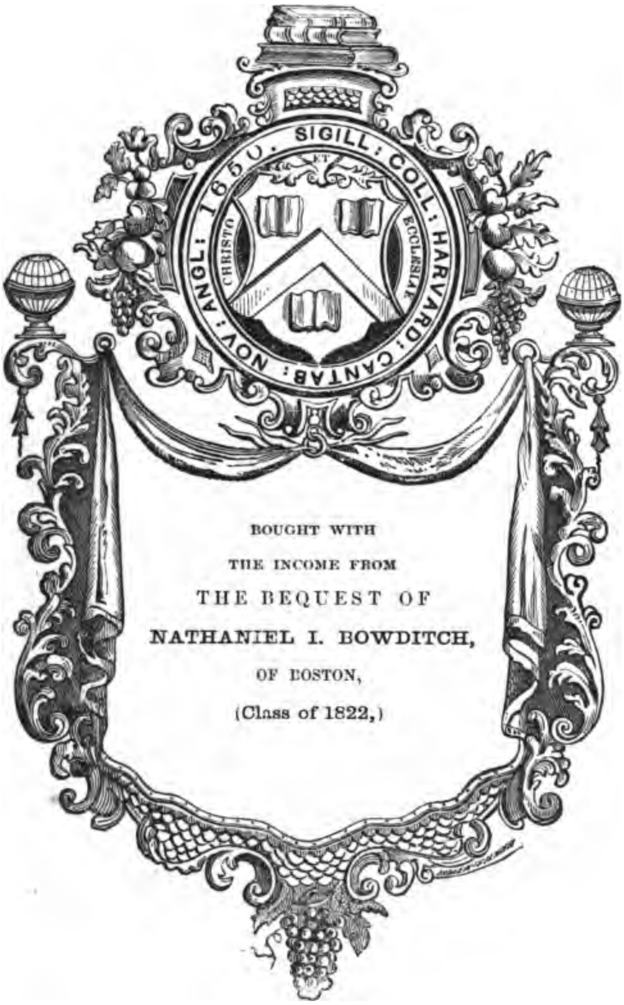
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

WIDENER LIBRARY
HX GG3L K

Sci 720.75


SIGILL: COLL: HARVARD: CANTAB: NOV: ANGL: 1650.
CHRISTO ET ECCLESIAE

BOUGHT WITH
THE INCOME FROM
THE BEQUEST OF
NATHANIEL I. BOWDITCH,
OF BOSTON,
(Class of 1822,)

SCIENCE CENTER LIBRARY

Sci 720.75

SIDEREAL MESSENGER
ASTRONOMY AND ASTRO-PHYSICS
POPULAR ASTRONOMY

A GENERAL INDEX

GENERAL INDEX

—TO—

Sidereal Messenger, Vol. 1-10
MARCH, 1882—DECEMBER, 1891

Astronomy and Astro-Physics, Vol. 1-3
JANUARY, 1892—DECEMBER, 1894

Popular Astronomy, Vol. 1-16
BEGUN, SEPTEMBER, 1893

By Authors and By Subjects

Compiled under the Supervision of
THE EDITOR

NORTHFIELD, MINNESOTA, U. S. A.
1909

4
(3)

HARVARD COLLEGE
NOV 23 1909
LIBRARY.

Bowditch fund

BOUND MAR 26 1910

COMPOSED AND PRINTED BY
NORTHFIELD NEWS
NORTHFIELD, MINNESOTA

The Editor gratefully acknowledges a grant of One Hundred Dollars by Professor E. C. Pickering from the International Science Fund of Harvard College Observatory, and a gift of Two Hundred Dollars from G. R. Agassiz, of Boston, to assist in the publication of this General Index.

—WILLIAM W. PAYNE.

KEY TO ABBREVIATIONS USED

S—Sidereal Messenger.
A—Astronomy and Astro-Physics.
P—Popular Astronomy.
Cor.—Correction.

Index of Authors

INDEX OF AUTHORS

	Volume and Page
ABBOTT, C. G., Probable nature of the corona	**P16**:519
ABNEY, W. de W., Limit of visibility of spectrum rays	**A1**:296
Medal-awarding address	**A3**:283
ADCOCK, R. J., Equations for an ellipse drawn through 5 points	**S9**:222
AITKEN, R. G., Companion to β *Orionis* (= β 555)	**P6**:585
On double stars	**P13**: 65
Orbit of β *Delphini*	**P10**:486, **11**: 28
β 395 = *Ceti* 82	**P13**:190
ζ *Sagittarii*	**P9**: 57
Review: *Double Star Catalogue* by S. W. Burnham	**P8**:228, **P15**:404
Sources of Standard Time in the U.S.	**P10**: 12
ALBRECHT, S., Distortions of photographic films on glass	**P15**:463
AMES, J. S., Line spectrum of oxygen	**A3**:505
Modern spectroscope	**A1**: 28
Probable spectrum of sulphur	**A2**: 50
Work of Kayser and Runge on spectra of elements	**A2**:226
ANDERSON, T. D., Searching for new stars	**P10**:246
APPEL, D., Free escapement with independent balance	**A1**:872
ARCTOWSKI, H., Northern and southern lights at the same time	**P9**:207
AUHAGEN, W., A Demonstration	**P15**:445
AYER, J. E., Gravitation	**P13**:170
BACKHOUSE, T. W., Maps for tracing meteor paths	**S5**:114
Structure of the sidereal universe	**S9**:337
BACON, C. A., Sun-spot observations at Smith observatory	**S9**:137, 230, 278, 375, 417, 467; **S10**:36, 103
BAILEY, S. I., ω Centauri	**A2**:689
BAKER, R. H., and D. TODD, Predictions of eclipse, Aug. 30, 1905	**P13**:240
BARNARD, E. E., Astronomical photography with a portrait lens	**P16**:286
Aurigae, Nova	**P2**:307
Comet II 1882 (*b* 1882)	**S1**:221, 255
V 1889 (*d* 1889)	**S8**:360
V 1892, (*e* 1892) Photographic discovery of	**P3**: 13
c 1893 Brooks (Oct. 17, 1893)	**A3**:789; **P1**:145
d 1907 (Daniel)	**P16**:591
Gale, Photographs of	**A3**:421, 706
Swift observed and photographed	**A1**:386
Comets' tails and their probable explanation	**P12**: 1
Determination of ball and ring system	**P2**:295
Development of photography in astronomy	**P6**:425
Diameter of Ceres, Pallas and Vesta	**A3**:341
Diameters of south polar caps of Mars, 1892 and 1894	**P2**:433
Eclipse of moon, 1889	**S8**:137
in Sumatra	**P9**:527

	Volume and Page
BARNARD, E. E., *(Continued)*	
Eros observed at Yerkes observatory	P8:519
Four little sky travellers	P3:143
Gegenschein or zodiacal counterglow	P1:337; P7:169
Jupiter's spots and markings, Motions of	S10:413
red spot	A1:93, 686; A3:736; P2:129
satellite III	A3:821
V	A3:556; P1: 76
satellites	A3:272, 438
Mars observations at Lick observatory	A1:680
Mercury, 1894, Transit of	P2:158
Merope nebula, Drawings of	S1: 24
Meteor trains drifting	S1:174; S10:426
Meteors, Biela	S5: 74
Photography of	P5:281
Micrometrical determination of dimensions of planets and satellites	P5:285
Nearer to the stars	P2:245
Nebulosities and clusters in the Milky Way, Photographic	A3:177
ρ Ophiuchi nebula and smallness of ground-work stars	P5:227
Orion nebula, Great photographic	A3:811; P2:151
Pleiades, Exterior nebulosities of the	A3:768
Swift's nebula in *Minoceros*	A3:642
Trifid nebula, Photographs of M8 and	A3:791
Photographing with a non-photographic telescope	S10:331
Proper motion of stars in the Dumb-Bell nebula	A3:445
Saturn, Transparency of Crape ring	A1:119
Stellar photography	S6: 58
Strange astronomical coincidences	S10: 18
Vacant regions of the sky	P14:579
Variable in M13 *Herculis*	P8:486
Venus' transit	S1:290
BARNUM, C. C., Sophie Kowalevski	A1:281
BARR, J. M., Orbits and velocity curves of spectroscopic binaries	P16:259
Study of variable stars	P15:217
BARTLETT, A. K., Curious optical illusions	P12:123
Heavens in winter	P13: 30
Moon and the weather	P10:368
Origin of the tides	P11:494
Solar and sidereal time	P12:649
Wet and dry moon	P9:442
Zodiacal light	P10:179
BECKER, L., Spectroscope of the Royal observatory, Edinburgh	A2:542
Spectrum of Nova *Persei*	P12:603
BELOPOLSKY, A., Motion of ζ Herculis in line of sight	A3:130
Spectrum of *β Lyrae*	A2:258
Sun's rotation determined by faculæ	A2:632, 637

	Volume and Page
BICKERTON, A. W., Explosion of stars	P12:666
BIGELOW, F. H., Aurora-inclinometer, A new	S10:496
Automatic transit instrument	S7:205
Computations of clock corrections	S7: 97
Cooling envelopes	S6:170
Eclipse expedition to West Africa	S9:145
Function of criticism in the advancement of science	P7:252, 292
Harkness, William	P11:281
Heliographic longitudes	A2:821
Magnetic fields surrounding the sun	A2:706, Cor. A2:848
Mounting telescopes for eclipse observations	A1:257
Photographic method of determining stellar places	A1: 42
Polar radiation of the sun	A3: 25
Solar corona of total eclipse, 1893	A2: 97
Standardizing photographic films without a standard light	S10:385
Sun as a magnetized sphere	P14:37, 463
Sun-spots as vortex rings	S6:139
Weather indications along the eclipse path, May 28, 1900	P7:451
West Indian hurricanes and solar magnetic influence	A3:441
BIGOURDAN, Eclipse of Aug. 30, 1905, at Sfax, Tunis	P14: 28
BISHOP, S., Origin of the red glows	S5:128
BLAKSLEE, T. M., The law of the lanes	P13:111
BLINN, F. G., A non-interfering break-circuit for clocks	S10:475
BLISS, G. A., Motion of a heavenly body in a resisting medium	P6: 20
BOCCARDI, G., Photography of the heavens	P12:521
BORASTON, J. M., Andromedes	A2: 3
Distribution of stellar types	A2: 57
BOSS, L., Comets; their composition, purpose, and effect upon the earth	S1: 1
Convergent of a moving cluster in *Taurus*	P16:566
"National" vs. "Naval" observatory	S10:161
BOWEN, E. A., Jupiter at opposition	P1:133
Lesson on harvest moon	P1: 32
Visualizing the earth's annual motion	P1:178
BOYD, J. H., Position of orbit of companion of a binary star	P3: 19
BOYS, C. V., Newtonian constant of gravitation	P3:128, 167; P4:77, 120
BRACKETT, F. P., Leonids observed at Park college	P8:163
Pomona college	P7: 30
BRACKETT, S. H., Improvised chronograph	A1:252
BRASHEAR, J. A., Allegheny observatory	P8:541
Care of, and cleaning of, object-glasses	P2: 9
Clark, G. B.	A1:367
European trip	S7:391; S8: 7
Keeler, James E.	P8:476
Langley, Samuel P.	P14:257
Manufacture of glass for optical uses	P6:104
telescope objectives	P1:221, 241, 447; P2: 57

	Volume and Page
BRASHEAR, J. A., *(Continued)*	
Refinement of modern measurements	**S9**:204
Ring of light around Venus	**S1**:263
Rock salt for optical purposes	**S5**:149
Solar eclipse of 1888 report	**S8**:120
Standard dimensions in astronomical instruments	**S7**: 77
Swasey, Ambrose	**P7**:345
BRENKE, W. C., Apparent figure of the sky	**P9**:351
Leonids in 1901	**P10**:105
BRESTER, A., Jr., Theory of the sun	**A2**:914; **A3**:218
Views on tranquility of the solar atmosphere	**A3**:849
BRIDGES, R., The Astronomer (C. A. Young)	**P13**:172
BRONTE, P., Halley's Comet in 1835	**P12**:571
BROOKINGS, E. J., The red light	**S9**:149
Waters upon the earth	**S8**:301
BROOKS, W. R., Comet seeking	**P7**:157
BROWN, E., Unusual sun-spot	**A2**: 74
BROWN, S. J., Astrophotographic conference, July, 1900	**P8**:355
Solar parallax from observations of *Eros*	**P8**:353
BROWN, W. V., McKim observatory equipment	**S4**:305
BRUCE, R. E., Notes on sun-spots	**P13**: 82
BRYANT, C. S., Aurora	**S1**: 88
BUCHANAN, R., Approaching opposition of Mars	**P13**:137
Art of computing	**P15**:287
Constants for the equator	**P16**:346
Differential calculus by means of finite differences	**P13**:245, 309
Equinoxes of the planets	**P13**:282
Planetary aberration	**P13**:376
Semi-diameter of the planets	**P13**:209
Synodic period of Jupiter and Saturn	**P16**: 65
Using Professor Newcomb's planet tables	**P15**:133
Visual brilliancy of the planets	**P13**:175
BUMSTEAD, H. A., Josiah Willard Gibbs	**P11**:446
BURCKHALTER, C., Disappearance of Saturn's rings	**P16**:127
Observations at Cloverdale, California	**S8**: 97
BURGESS, G. K., Value of the gravitation constant	**P10**:421
BURNHAM, S. W., Astronomy in Russia	**A2**:595
Barnard, E. E.	**P1**:193, 341, 441
Binary star systems, The	**P4**:160
stars; β 416 and *Scorpii* 185	**S10**:489
β 208	**A1**:464
β 612	**A1**:268
Bright-wire illumination for micrometers	**S1**:110
Camera for celestial photography	**S10**:325
ζ *Cancri*, System of	**A2**:872

Volume and Page

BURNHAM, S. W., *(Continued)*
- *β Cassiopeiae,* Companion to P8:540
- Double star *γ Andromedae* S10:118
  - 26 *Draconis, β* 962 . . . . . . S8:356
  - *ε Hydrae* S8:207
  - β 107 . . . . . . P7:1; P8:528
  - Σ 186 . . . . . . S10: 72
  - A lost P11:250
  - measures at Royal observatory, Belgium P13: 15
  - observations at Cape of Good Hope P13:333
    - Flower observatory P10:129
  - observing S1:25, 73
  - orbit found by graphical method P1:243, 349
  - stars discovered at Washburn observatory S9:299
- Ellipsograph and Protractor . . . . . . P4:181; Cor. P4:336
- Enlarging photographic lens A1:558
- 52 *Herculis* (β 627) A1:465
- Hough Catalogue and re-measurement of double stars (E. Doolittle) P15:624
- Hussey's measures of the O Σ double stars P9:553
- Measures of 748 double stars S3: 67
- Orbit of 9 *Argus* A3:290
  - *ξ Aquarii,* (Σ 2909) P4:474
  - *Castor* P4:286
  - 35 *Comae Bernices* (Σ 1687) and O Σ 4 . . . . . . P5:125
  - *λ Cygni,* O Σ 413 . . . . . . P4:397
  - *β Delphini* (β 151) S10:215
  - *τ Ophiuchi* P4:347
  - Σ 1216 . . . . . . P5:450
  - Σ 2107 . . . . . . P5:449
  - O Σ 215 . . . . . . P4:543
  - O Σ 285 . . . . . . S10:273
- Period of *δ Equulei* (O Σ 535) S2:244
- Place of Tycho Brahe's star S9:449
- Poulkowa double star measures A3:354
- Proper motion of components of 61 *Cygni* S10: 1
  - β 182 . . . . . . P8:530
  - β 612 . . . . . . S10:323
  - *Procyon* A3:434
  - Σ 1321 . . . . . . S10:168
  - Σ 1604 . . . . . . A1:870
  - motions of double stars A3: 14
- Recent double star work P14: 79
- Researches in the evolution of stellar systems P4:471
- Small vs. large telescopes S4:193
- Struve double stars (Lewis) P14:523

	Volume and Page
BURNS, G. J., Number of the stars	**P12**:267
BURNS, K., Solar parallax by spectrographic observations of Venus	**P15**:556
BYRD, M. E., Astronomy by the laboratory method in secondary schools	**P7**:472; **P10**:131; **P14**:294
in the high school	**P11**:550; **P12**:24, 199; **P13**:545; **P15**:227
First observations of the sun and moon	**P1**:216, 252
Hints on popular study of astronomy	**S6**:151
Laboratory for general astronomy	**P10**:131
Plea for elementary astronomy	**P15**: 25
Popular fallacies about observatories	**S5**:263
Stars and the Milky Way	**P6**:288
Winlock, Anna	**P12**:254
CALLANDREAU, M. O., Comparison of minor planets and short period comets	**P12**:117
Henry, Prosper	**P11**:558
CAMPBELL, F., Auroral arch of Aug., 1903	**P15**:448
Determining Sundays in February	**P11**:167
Might a comet strike the earth?	**P8**:253
Remarkable phenomenon	**P11**:484, 575
CAMPBELL, W. W., *Aurigae,* Observations of Nova	**A1**:715, 820, 881; **A2**:149, 417
Castor, a quadruple star	**P13**: 87
Comparative power of the Lick 36-inch refractor	**P16**:560
Earthquake of April 18, 1906, and Lick observatory	**P14**:441
Hydrogen envelope of DM+30°3639	**A2**:913
Mars' atmosphere	**P3**:439
Normae, Observations of Nova	**A3**:311
Solar eclipse of Aug. 30, 1905	**P12**:456
Spectra of comets *b* and *c* 1893	**A3**:571
Orion nebula and others	**A3**:384, 494, 695
Spectroscopic observations of motions	**A1**:319
Spectrum of γ *Argus*	**A2**:555
Aurigae, Nova	**A1**:799; **A2**:722
comet *a* 1892 (Swift)	**A1**:698
Mars	**A3**:752
Sun's distance obtained from observing *Eros*	**P9**: 88
Wolf-Rayet stars	**A3**:448
CAMPBELL, W. W., and C. D. PERRINE, Announcing satellite discoveries	**P14**:135, 252
CARLISLE, C. W., Observations with a small telescope	**P12**:328
CHALLICE, R., Are the planets inhabited?	**P11**:417
CHAMBERS, G. F., History of astronomy	**S10**:457
New general catalogue of stars	**S9**:203
CHANDLER, C. H., Apparent size of the sun	**P7**:342
Silvering glass mirrors	**A2**: 93

	Volume and Page
CHANDLER, S. C., Almucantar tests	S2:269
Astronomical work of W. L. Elkin	P3:392
Latest knowledge of the motion of the pole	P6:509
Life and work of Dr. B. A. Gould	P4:341
Planet DQ 1898, The name of the	P7: 26
Positions determined near plate borders	P7:286
Problem for beginners in cometary computation	P6:459
Rotation period of Venus and Mercury	P4:393
CHARROPPIN, C. M., Mirage	P5: 23
Stephen J. Perry	S9:197
Washington university eclipse party	S8:122
CHRISTIAN, I. E., Gegenschein, The	P9:146
Meteors and stellar scintillation	P1:414
Moon's secular acceleration	P7:329
Solar corona	P7: 28
Tidal friction and planetary rotations	P9:194
CHRISTIE, W. H. M., Micrometer for measuring astrophotographic plates	A2:588
Wire-intervals for transit instrument, Determination of	P15:302
CLARK, A., Autobiography	S8:109
CLARK, A. G., Great telescopes of the future	A2:673
Possibilities of the telescope	A2:319
CLARK, G., Value of photography for astronomical investigations	P9:294
CLARK, J. M., The English mile	S9:155
CLARKE, H. L., Life history of star systems	P3:489
CLERKE, A. M., Distribution of the stars	A2:515
Is star-strewn space infinite?	P4:431
New star in *Auriga*	A1:504
System of ζ *Cancri*	S9:300
Yale measurement of the *Pleiades*	S6:254
CLEVENGER, S. V., Optical appearances of comets	S6: 89
COAKLEY, G. W., Are comets ever repelled by the sun?	A1: 97
Comets, Additional points relating to	A1:652
Eclipses and occultations computed	S4:207
Nebular hypothesis of LaPlace	S7:132, 191
Orbit of a body approaching the sun	S10:305
Probable origin of meteorites	A1:753
Relation between a planet's rotation and revolution times	S10:217
Stability of the rings of Saturn	S9:3, 67
Tidal theory of the forms of comets	A1:177
CERASKI, W., Stellar magnitude of the sun	P14:226
COGSHALL, W. A., November meteors	P7: 71
COIT, J. B., Aurora of Aug. 21, 1903	P11:534
Solar prominence	P12:455

Volume and Page

- COLBERT, E., Intra-Mercurial observations S6: 84
  - Motion of lunar apsides S6: 49
- COLLINS, F. H., Cyclone theory of sun-spots A1:826
- COLTON, A. L., and J. M. SCHAEBERLE, Parallax of a meteor determined by photography P5:232
- COMMON, A. A., Address on astronomy P8:417, 496
  - before Royal Astronomical Society P5: 1
  - Photographs of nebulae S8: 25
  - Silvering glass mirrors A1:852
  - Two large telescopes A2: 11
- COMSTOCK, G. C., Aberration and atmospheric refraction of light A3:339
  - Adjustment of a sextant S7:129
  - Atmospheric refraction at Madison, Wis A2:769
  - S. W. Burnham on double stars S10:277
  - Constants of refraction and aberration S6:310
  - Defects of sensitive levels S10:299
  - Double star observations S9: 78
  - Efficiency of a small instrument S10:406
  - Establishing a meridian line P9:246
  - Graphical representation of a comet orbit P6:465
  - Lick observatory meridian circle S5:225
  - Motion of comets when far from the sun P10:169
  - Problems in the astronomy of precision P4:457
  - Refraction in zenith distance S9:186
  - Saturn's rings S10:468
  - Significance of the star-ratio P15:131
  - Sun's motion referred to group of faint stars P12:112
  - Time and latitude determined from equal altitudes of stars P11:238
  - Value of one revolution of a micrometer screw S7:343
    - Correction S7:409
- COOKE, W. E., Device for facilitating meridian circle transitings P10:365
  - Obtaining time, latitude, azimuth accurately for field-work P11:169
  - Perth catalogue of 420 standard stars P16:192
    - observatory meridian work P15:499
- COPELAND, R., Naval observatory S3:270
  - Nova in *Auriga* A1:593
  - Grant, Robert A1:878
  - Mars satellite, Pretended early discovery of A1:553
  - Smyth, C. Piazzi P8:384
- CORDEIRO, F. J. B., Atmosphere P13:384
  - Color-Perception P16:609
  - Gravitation P13: 8
  - Gyroscope P15:81, 146
- CORNU, A., Study of diffraction gratings A3:207

Volume and Page

CORRIGAN, S. J., An astronomical theory of the molecule and an electronic theory of matter—
..............**P15**:585; **P16**:25, 98, 148, 300, 367, 411, 493, 533, 619
Comet meteor streams..............**S5**:145
Constitution and function of gases..............**P4**:247
Effects of collision between asteroids..............**A2**:207, 304, 474
rotation upon the fluid envelope..............**S7**:369, 420; **S8**: 49
Intra-Mercurial planets, Conditions of visibility of..............**P5**:89, 139
Probability of four..............**P4**:414
Longitude from sextant observations..............**S6**:175
Meteoric orbits and radiants..............**S5**:33, 100
Probable origin of comet Holmes..............**A2**:24, 99
Radiant energy, Probable effects of..............**A1**:362
through gaseous media, Transmission of..............**A1**:1, 108
Rotation time a function of density..............**S8**:210
Simonton, T. D..............**P16**:466
Surface temperatures of Mars, Venus and Mercury..............**P16**:258
Theoretical parallax of the *Andromeda* nebula..............**P16**:256
CORTI, J. S., Simultaneous determination of latitude and azimuth..............**S10**:189
CORTIE, A. L., *Auriga,* Temporary star in..............**A2**:521
Chromosphere line Angström 6676.9..............**A1**:135
Problems of solar physics..............**P15**:173
Studies on the solar spectrum..............**A1**:393
Sun-spot group of 1891..............**A1**:130
positions measured by Stonyhurst disks..............**P16**:426
spectra..............**A1**:587
COURVOISIER, L., Leo de Ball's refraction tables..............**P15**:456
COX, H. J., Recent studies in the solar constant..............**P13**:147
CRAWFORD, R. T., Computing elements of asteroids from daily motion
.... **P14**:397
and W. F. MEYER, Orbit of Jupiter's satellite VIII..............**P16**:491
CRAWLEY, E. S., Solar heat and gravitation..............**S7**:325
CREW, H., Concave grating to study stellar spectra..............**A2**:156
Gravity with altitude, Variation of..............**A3**:404
Light, Theoretical and Practical by R. T. Glazebrook..............**A3**:402
Measurement of solar prominences..............**A1**: 90
Method of obtaining color curve of a lens..............**A1**:933
Pringsheim on Kirchhoff's law..............**A1**:581
Radiation of heated gases..............**A3**:587
Theory of optical instruments, C. Czapski..............**A3**:241
Spectrum of Nova in *Auriga*..............**A1**:231
sun-spot group, February, 1892..............**A1**:308
CREW, H., and R. TATNALL, Mapping the spectra of metals..............**A3**:741
CROMMELIN, A. C. D., Announcing discoveries of satellites..............**P14**:147, 380
Astronomical work for 1905..............**P14**: 11
New planet TG..............**P14**:472

	Volume and Page
CROOKES, W., Recent advances in science	**P6**:493; **P7**: 3
CROWL, G. M., New earthquake theory objectionable	**P16**:394
CURTIS, R. H., Reduction of radial velocity spectrograms	**P15**: 68
CUTLER, MARY B., The Superstructure	**S5**:267
DANIEL, Z., Comet *c* 1898 (Coddington)	**P6**:358
and H. N. RUSSELL, Venus as a luminous ring	**P15**:516
DARWIN, C. H., Evolution of double stars	**A2**:413
d'AURIA, L., Constitution of the ether	**P15**:101
Kinetic theory of gases	**P15**:210
and correctness of equations Errors, in	**P15**:357; **P16**:241
Relation of mass of universe to stellar dynamics	**P12**: 20
between speed of stellar motion and velocity of wave propagation bearing on the nature of ether	**P11**:254
DAVIDSON, G., Intra-Mercurial planets	**S3**:113
Meteors, Nov. 23, 1892	**A2**: 86
Occultation of *Aldebaran*	**S6**:195
α Tauri	**S6**: 45
Vision, Limits of	**P10**:111
DAVIS, H. S., Allen, Richard Hinckley	**P14**:593; **P16**:189
Calculating machines	**P4**: 20
Computing transit factor tables	**P10**:303
Concise knowledge library,—Astronomy, A. M. Clerke	**P6**:190
List of stellae novae	**P9**:284
Notes on mathematical symbols	**P5**:402
nomenclature of some Piazzi stars	**P13**:423
Outline of the history of astronomy	**P6**:455
Parallaxes and connection of 61 and 61^2 *Cygni*	**P6**:487
Rittenhouse, D.,	**P4**: 1
Women astronomers	**P6**:129, 211, 220
DAWSON, W., Number of sun-spots	**S3**:171
DEAN, J. C., Story of Halley's comet	**P16**:331
DENNING, W. F., Astrographic chart	**P5**: 62
Chief discoverers of comets	**S9**:235
Comet and meteor observations	**P10**: 69
1862 III? Who discovered	**P7**:15; Cor. **P7**:105
Fireball	**P5**:167
Jupiter, Dark spot on	**P7**: 14
Motion of the red spot on	**S9**:140; **P11**:4, 460; **P15**:398
Red spot on	**S5**:62, 281; **P9**:488; Cor. **P10**: 56
Markings and rotation Period of Saturn	**P12**: 40
Mercury as a naked eye object	**P8**:202
Meteors	**S9**:141; **P15**:168
Heights of	**S8**:299
Paths of brilliant	**P10**:121
Meteor radiants	**S9**:438; **S10**:234; **A3**:600, 872
showers	**S5**:61, 106, 167; **S6**:160, 287, 356; **S7**:447; **P16**:198

Volume and Page

- DENNING, W. F., *(Continued)*
  - Meteoric observations **P13**:107
  - Naked eye comets **P15**:411
  - Planetary observation **P11**: 19
  - Shooting stars **P1**:34, 67, 97, 147, 208, 267, 296, 336, 345, 438
    - and aerolites, Nature of **A1**:481
  - Small vs. large telescopes **S4**:259
  - Telescopic meteors **P15**:170
- DENT, E. A., Herschel, Caroline **P11**:123
- DESLANDRES, H., Radial motion of the stars with siderostat **A1**:157
  - Remarkable prominence **A1**:502
  - Solar atmosphere **A1**:60, 314
  - Spectra of sun and Nova *Aurigae* **A1**:712
- DEWAR, J., Liquefaction of gases and low temperatures **P10**:469, 531; **P11**:8, 79, 117
  - and C. D. LIVEING, Spectra of flames **A1**:215
    - and metallic compounds **A2**:434
    - Spectrum of liquid oxygen **A1**:705
- DINWIDDIE, W. W., Conducting electric circuits to the eye end of an equatorial **P10**:300
- DIXON, S. M., Photo-electric effect of starlight **A1**:844
- DOLE, R. M., Perseid meteors **P10**:499; **P13**:347
  - " and Lyrid meteors, 1903 .... **P11**:514
- DONAGHE, H. R., Photographic flashes from Harvard observatory **P6**:481
- DOOLITTLE, C. L., Flower observatory of Pennsylvania university **P5**:122
  - Longitude by moon culminations **S4**:231
  - Ring micrometer observations of comets Fabry, and Barnard **S5**:256
  - Some observatories and observers **P11**:467
- DOOLITTLE, E., Discovery of an unseen body, F 70 *Ophiuchi* **P3**:329
  - Effect of refraction on the measures of double stars **P5**:143
  - Lost double star **P13**:398
  - Perfection of mounting of great telescope **P7**:149
  - Results of Helmholtz's theory of solar contraction **P3**: 21
  - Variation of latitude **P3**:105
  - Wharton reflex zenith tube **P14**:530
- DOUGLASS, A. E., Almucantar, A new **P11**:252
  - Ascent of Popocatapetl **P5**:505
  - Astronomer's globe **P5**: 57
  - Atmosphere, telescope and observer **P5**: 64
  - Comet 1892 I (Swift) **A2**:202
  - Effect of mountains on atmosphere **P7**:354
  - Gegenschein observations **P2**:29; **P5**:178
  - Jupiter, Disks of its satellites **A3**:517
    - Drawings of satellite III **P5**:308
    - Surface markings **P8**:473

	Volume and Page
DOUGLASS, A. E., *(Continued)*	
Lowell observatory and its work	P2:395
in Mexico	P4:489
Mars	P7:113
Lick review of	P4:199
Polar cap of	A3:738
Predictions of projections on terminator of	P11: 24
and planetary work	P7: 74
Persei, Nova	P9:263
Scales of seeing	P6:193
Stellar bands in the zodiac from *Gemini* to *Scorpio*	P5:511
Zodiacal light, Photographs of	P8:174; P9:190
DOWNING, A. M. W., and J. J. STONEY, Ephemerides for two situations in the Leonid stream	P7:403
Perturbations of the Leonids	P7:227
DREW, D. A., Calendar for Mars	P4:417
DUNER, D. C., Is there oxygen in the atmosphere of the sun?	A3:215
DUPUY, A. B., Reflectors vs. refractors	S8: 88
EADIE, J. H., *Andromeda* nebula	S4:298; S5: 79
Meteor observations	S5:317
Star colors	S7:219
EASTMAN, J. R., Longitude and latitude of the new Naval observatory	A2:699
Neglected field of fundamental astronomy	A2:126, 315
Transits of inferior planets	S2:182
EASTON, B. S., Sun-dial of Ahaz	P7:242, 277
EBERT, H., Electro-magnetic theory of the sun's corona	A2:804
Spectra of new stars	P12:239
EDDIE, L. A., Meteor trail seen at Grahamstown, Oct. 22, 1895	P3:271
Spectrum of γ *Argus*	P3:123
Lunar eclipse of March 11, 1895	P2:449
EDGECOMB, D. W., Notes on the invention of the telescope	P7:184
Performance of a 6¼ inch binocular	P10:523
Reflectors	P2:366
Teneriffe, Alte Vista, Leyde	S9:392
Visit to Slough	S9: 52
EDMUNDS, J., The twentieth century	P8:140
ELCHARWICH, F., Lunar cusps with the horizon	P7: 52
ELKIN, W. L., Instrument for photographing meteors	A3:626, P2: 17
Mean parallax of first magnitude stars	S7:395
Velocity of meteors from photographs	P7:441
ELLIOTT, S. B., New system of mounting a telescope at Amherst	P10:463
ELLIS, J. T., Star of Bethlehem	S6:360
ELY, O., Is the universe infinite?	P16:435
ENGLEHARDT, B. von, Total solar eclipse of 1887	S7:161
ENNIS, J., Center of sidereal system	S2:113
Colors in the solar corona	S6:273

	Volume and Page
ENNIS, J., *(Continued)*	
Electric phenomena in solar system	S5:234
Total solar eclipse of August 1887	S6:105
Two problems in sidereal astronomy	S2: 67
ESPIN, T. E., Spectrum of *α Herculis*	A3:651
EVANS, H. B., Orbit of Δ 15	P7:306
EVERSHED, Jr., J., Distribution of solar prominences, 1891	A1:426
Faculae and prominences photographed	A2:628
Parallax of the gegenschein	P7:289, 352
Solar prominence photography	A1:827
EWELL, M. D., Underwood observatory	S10:519
FAULHABER, C., Construction of large telescope lenses	P13:534
FATH, E. A., Comet *a* 1901	P9:289
Northern limit of the zodiacal light	P16:633
FEATHERSTONE, W. B., Photographing the corona	P8:250
FENYI, J., Solar prominence, 1892	A1:609; A2: 37
Enormous velocity of the	A1: 63
Sun-spot group, Phenomena observed on	A1:430
Two great protuberances	A3:122
FERGUSON, R. H., Sun-spots for 1885	S4:238, 261
FERREL, W., Variable star *Algol*	A2:429
FERRY, E. S. and E. P. LEWIS, Infra-red spectra of metals	A3:747
FICKLIN, J., New proof for differentials	S2:209
FITZGERALD, G. P., Existence of all-pervading ether proved	S7:386
FIZEAU, M., Aberration of light and solar prominences	A1:126
FLEMING, M., Stars having peculiar spectra	A1:27, 418, 765; A3:501
Novae in *Aquarius* and *Delphini*	S10:106
Perseus, Triangulum, and *Hydra*	S10: 7
FLEMING, Mrs. M., Field for woman's work in astronomy	A2:683
FOERSTER, W., Hencke, Karl Ludwig	S10: 20
and O. JESSE, Observations of night clouds requested	A1:859
FOLIE, F., Peters' observations treated by Chandler	A2:874
FOWLER, A., Approaching total eclipse of the sun	P4: 28
FOURIER, BARON, Historical eulogy on LaPlace	P3: 1
FRANKS, W. S., Roberts, Isaac	P12:469
FRIC, J., and FR. NUSL, Communication about the diazenital	P13: 16
FRISBY, E., Comet *b* 1882, (1882 II)	S2:188
Transit of Venus	S1:182
FROST, E. B., Photometric observations of the planets	A2:619
Potsdam spectrograph	A2:150
Relative activity in two solar hemispheres	S9:109
Thermal absorption in the solar atmosphere	A1:720
Total solar eclipse of May 28, 1900	P8: 86
Unit of velocity in the line of sight	A3:160
FURNESS, C. E., Photographic catalogue of north polar stars	P9: 1
Scientific value of total lunar eclipse	P3:109

Volume and Page

FURNESS, C. E., *(Continued)*
Tycho Brahe **P3**:221
FURNESS, H. H., Jr., Equation of Cartesian co-ordinates **S9**:200
GERRISH, W. P., Break-circuit for clocks **S9**:124
Transit observations by photography **S9**:111
GETMAN, F. H., The ether **P7**: 86
GIBSON, F. M., Care of the telescope **P1**:412
GIBSON, W., Number of the stars **P14**:594
GILBERT, B. D., Peters' celestial charts **S1**:288
GILL, D., Extracts from presidential address **P15**:467, 528
GILL, W. J., Jr., Variable stars **P4**:434
GILPIN, C., Jr., Approximation of greatest root of cubic equation with 3 real roots **P14**:641
GLASENAPP, S., New variable star in *Aries* **A2**:503
Orbit of binary 20 *Persei* = β 524 .... **A2**:499
β 416, (*Scorpii* 185) **A2**:402
double star O Σ 224 .... **A2**:702
β 612 .... **A1**:466
GODDARD, H. C., Subdividing the surface of a sphere into congruent parts **P10**:406
GOODENOW, S., Velocity of sound **S8**:307, 382
GORE, J. E., Astronomical facts and fallacies **P16**:525
Brightness of starlight **P9**:506; **P10**:227
Companion of *Algol* **P12**:359
Immensity and minuteness **P10**:225
New cosmogony **P14**:515
Orbit of binary O Σ 224 .... **A3**:559
70 *Ophiuchi* **S10**: 45
Spectra of stars in the Milky Way **A1**:326
of large proper motion **A1**: 11
GORE, J. H., How the earth is measured **A2**: 26
GRAFF, K., Variable star observations at Hamburg **P13**:514
GRAY, B. L., and W. E. WILSON, Effective temperature of the sun **A3**:382
GREGORY, R. A., Spectroscope in recent chemistry **P3**: 70
GRIFFITHS, H. F., Physical aspect of Jupiter in March, 1896 .... **P4**: 25
GRIGGS, H. W., Brilliant meteors **P14**:571
Lantern projection distances **P15**:316
GRUBB, H., Good astronomical telescopes **S7**:106
GURLEY, W. C., Electrical control of equatorials in photography **A3**:641
HADDEN, D. E., Auroral phenomena at Alta, Iowa **P10**:249, 388
o Ceti observations **P7**:105
Grating spectroscope for small telescope **P3**:84, 152
Large sun-spots in 1903 .... **P11**:560
Solar observations ....
P7:408; **P8**:222; **P10**:254, 348; **P11**:488; **P13**:196; **P14**:603; **P15**:607
Spectroscope for small telescope **P12**:252

	Volume and Page
HADLEY, S. M., Masses of binary stars	P11:240; P13:260, 323
HAGEN, J. G., Atlas of variable stars	P5:20; P7: 85
Chart and catalogue for observing Nova *Persei*	P9:191, 279
Deflection of the level	S3:75, 107
Kepler's correspondence	S6:109, 133, 212
Laws of falling bodies	S4: 15
Lunar eclipses as problems for students	S3: 46
HALE, G. E., Astronomical work with inexpensive apparatus	P16:74, 167, 438
Astrophysical Journal	A1:17; A3:831
Heat radiation of the stars	P7:503
Kenwood physical observatory	S10:321
Magnesia fluting in connection with spectra of the nebulae	S10: 23
Pending problems in spectroscopy	S10: 89
Persei Nova	P9:264
Photographic study of the sun	A1:811
Photographing the solar corona without an eclipse	A2:260; A3:662
Photography and the invisible solar prominences	S10:257
Solar disturbance	A1:611
faculae	A2:450, A3:113
observatory mirror	P14:557
work	P15:563
photography at Kenwood observatory	A1:407
prominence photography	A1: 70
and terrestrial phenomena, Coincidence of	A2:167
Spectroheliograph	A2:241
and solar phenomena	A1:603
Spectroscopic observations of sun-spot group, Feb., 1892	A1:310
Sun's surface and terrestrial magnetism	A1:917
Ultra-violet spectrum of the solar prominences	A1:50, 602, 821
Yerkes observatory of the university of Chicago	A1:790
HALL, A., Aberration and solar parallax	S2:165
Clairaut's theory of the figure of the earth	P9: 60
Commensurability of motions	S4:200
Determination of orbits	P13:353
Elliptic motion	P13:287
o^2 *Eridani*	S1: 94
Euler-Lambert equation for parabolic motion	P8: 2
Gould, B. A.	P4:337
Images of the stars	S5: 97
Note on multiplication	P9: 31
Parallax of *α Lyrae* and 61 *Cygni*	S2: 1
Photographs of occultations of Mars, 1892	A1:610
Planet DQ, 1898, (*Eros*)	P6:567
Plus probans quam necesse est	P7: 13
Rejection of discordant observations	S6:297
Resisting medium in space	S8:433

	Volume and Page
HALL, A., *(Continued)*	
Rule for squares of consecutive numbers	P9:161
Sketch of theoretical astronomy	P5: 9
Spheres of activity of the planets	P7:180
Transformation of differentials of area and volume	P10: 5
Work of astronomy	S4: 97
HALLEY, E., Elogy on Sir Isaac Newton	P12:504
HALSTED, G. B., Astral geometry	P9:187
Non-Euclidean geometry	P7:482, 519; P8:8, 189, 267; P9:555; P10:26, 176
HANCOCK, A. B., LaPlace on latitude variations	P2:349
HANCOCK, H., Ptolemy's argument against the rotation of the earth	S9:293
HARKNESS, W., Astronomical photography with commercial lenses	A1:641
Comets' orbits represented by models	S6:329
Magnitude of the solar system	A3:605
Method of measuring faint spectra	S1: 52
Total solar eclipse, 1887	S7: 1
Transit of Venus	S1:143
HARMON, O. E., Astronomy of Shakespeare	P6:232, 263, 321
Great circle on the celestial sphere	P4:555
Lesson in parallax	P1:403
Mitchel, O. M., ("Old Stars")	P5:413
Position of the earth's axis	P2:219
Twilight	P4:148, 211, 252; P5:257
HARMS, C. F., Novel observatory	P12: 73
HARPHAM, F. E., Angle-measuring instruments	P13:149
Hints for a small telescope	P2:106
Martin's "The Friendly Stars"	P15:384
Rutherfurd photographs	P8:129
HARRINGTON, M. W., Polarization of light of the asteroids	S3: 79
Tools of the astronomer	S2:248, 261, 297
HARRISON, H., Intra-Mercurial planets	S3:135
HARTLEY, W. N., Line in the spectra of the elements	A1:223
HARVEY, A., Aurora and zodiacal light	P10:332
Study of terrestrial magnetism	P9:467
HASSARD, A. R. J. F., Aurora	P15:256; P16:455, 517
Occultations of the moon in *Praesepe*	P16:328
Venus observation	P16:459
HASSELBERG, B., Index of refraction and dispersion of air	A2:455
Line spectrum of oxygen	A3:760
Spectroscopic investigations at Royal Swedish academy	A1:793
Spectroscopy of sulphur	A2:347
HASTINGS, C. S., Comet Cruls, *b* 1882, (1882 II)	S1:171
Construction of telescope objectives	S1:244; S2: 39
History of the telescope	S10:335
Objections to the theory of the corona	S2:307
Phenomena of Venus' transit	S1:273

	Volume and Page
HAYES, E., Path of the shadow of a plummet bead	**P16**:279
HAYES, L. D., Mirage from blast furnaces	**P16**:321
HAYWOOD, J., Annual motion of the earth	**S7**:286
Electric phenomena in solar system	**S5**: 81
Tangent Index	**S5**:270
Visible shadow of the earth	**S4**:243
HAZEN, H. A., West Indian hurricanes and solar magnetic influence	**A3**:105, 443
HENKEL, F. W., Halley's comet	**P15**:238
HERVEY, A. B., Northern lights	**P15**:446
HESS, F., Transit of Venus, 1882	**S1**:153
HESSE, F. H., Sun-spots and magnetic storms	**A1**:615
HIGGS, G., Geometrical construction of absorption lines in solar spectrum	**A2**:547
HILL, C. B., Reducing observations made with a transit	**A2**:212
HILL, G. A., Brorsen's short period comet	**A1**: 7
Finding a focal point of a lens of long focus	**P11**:379
New form of comet-seeker	**S7**:241
Requisites of a transit observer	**P13**:362
Search for Comet 1892 III, (Holmes)	**A3**:324
Untried method of determining the constant of refraction	**P13**:417
HIMES, C. F., Making of photography	**P8**: 26
HINKS, A. R., *Eros* and the solar parallax	**P11**:439
Reduction of 295 photographs of *Eros*	**P12**:531, 589
HIRAYAMA, S., Maxima and minima of sun-spot periods	**P15**:188
HOBBS, W. H., Goldschmidt law applied to the solar system	**P15**:345
HODGINS, G. S., Concerning the earth's motions	**P8**: 60
HOLDEN, E. S., Among the stars	**P8**:531
Figure of nucleus of comet 1882 II, Gould	**S1**:278
Lick eclipse expedition, 1889	**S8**:339
observations of Mars 1892	**A1**:663
observatory astronomical work	**P5**:181
telescope	**S7**:49, 296
Mercury's rotation period	**S9**:167
Meridian circle at Strassburg	**S3**:199
Orion nebula, Central parts of the	**S2**: 77
Photography of the planetoids	**P3**:343
Saturn and his satellites	**S8**: 1
Search for Neptune, 1845-6	**A1**:287
Stars for time determination	**S1**:124
Stellar magnitudes by photography	**S9**: 12
HOLMES, E., Limits of vision	**P9**:499
Planet Neptune	**P16**: 9
Shadow-bands	**P15**: 77
Suggested origin of comet Holmes	**A2**:370
HOLT, J. R., Canals of Mars	**A3**:347
Cause of the gegenschein	**P2**: 94
Polar snows and non-glaciation of Mars	**P2**: 78

	Volume and Page
HOLT, J. R., *(Continued)*	
Solar image reflected in seas of Mars	A3:257
Spectroscopic determination of stellar rotation	A2:646
HONEY, F. R., Eight-centered oval and ellipse	P16:617
HOOKE, R., Ring formation, The theory of	A2:766
HOOPER, J. R., Atmospheric conditions	S3:230
Formation of sun-spots	S7:397
Seas of Mars	P4:300
HOPKINS, B. J., Hints to observers of Saturn	S4: 49
HORNSBY, W. L., Chinese calendar	P10:229
HOUGH, G. W., Chronograph, Electrical connections for operating a	A3:184
A printing	S5:161
Comet *a* 1882, (Wells) (1882 I)	S1: 96
Dearborn observatory	S8:341
Doolittle's measures of Hough double stars	P16:478
Equatorial, Electrical control of	A3:524
Observing seat for	S1: 47
Illumination for a position micrometer	S9:161
Jovian phenomena	P11:297
Jupiter	P2:145; P3:519; P8:381; P10:393
Physical constitution of	A3:89; P11: 63
Present knowledge of the surface of	P13: 19
Red spot on	S4:289; S6:325; S10:378
Rotation of the surface of	P7:62; P11:114
Spots and markings of	A1:193
Occultations of stars by the moon, Computation of	P5:451
On an infinite universe	P16:461
Rotation of domes	S2:133
World's congress auxiliary	A1:462
HOUGHTON, S., Evolution of the earth	S1:147
HOWARD, C. P., Determining apparent orbits of binary stars	A3:425
Total eclipse of the sun, May 28, 1900	P8:550; P9: 18
Aug. 30, 1905, at Burgos	P13:542
HOWE, H. A., Adjustment of a small equatorial	P3:131, 193
Astronomical books for the use of the student	P9:29, 61, 169, 225
Comet *b* 1882, (1882 II)	S3: 97
Earth tremors	S8:448
Eclipses computed by students	S4:205
Experiments in electric lighting	A2:505
Galileo, his life and works, (J. J. Fahie)	P12: 80
Habitability of other worlds	S4:294
Logarithmic computations	S2: 45
Occultation of *Aldebaran*	P13:108
Place and function of astronomy in education	P6:369
Pleasures of the telescope (G. P. Serviss)	P9:286
Practical astronomy, (C. L. Doolittle)	S5: 63

	Volume and Page
HOWE, H. A., *(Continued)*	
Teaching of descriptive astronomy	P4:225, 363
20-inch equatorial of Chamberlain observatory	A3:709, 826
HUGGINS, M. L., Astrolabe	P2:199, 261; A3:793
HUGGINS, W., Limit of solar and stellar light	S9: 22
Photographing the solar corona without an eclipse	S1:282
Solar corona	S4:136, 167
Spectrum of Nova *Auriga*	A2:349, 609
Comet Wells, (1882 I)	S1:114
Mars	A3:771
Orion nebula	S9:303; A3:568
Sirius	S9:318
Tulse Hill spectroscope	A2:615
Visual appearance of Nova *Aurigae*	A3:314
HUGGINS, MR. and MRS. W., Nova *Aurigae*	A1:571
Photographic spectra of Uranus and Neptune	S8:450
Wolf-Rayet bright-line stars in *Cygnus*	S10: 49
HUNT, T. S., Cosmic physiology	S1: 50
HUNTINGTON, G., Hymn	S5:268
HUSSEY, E. F., Recent eclipse in Egypt	P14:129
HUSSEY, W. J., Comet *b* 1893, (Rordame) (1893 II)	P2:445
Photographs of	A2:661
i 1898 (1898 V), Orbit of	P6:556
Comet photography and Rordame	P2:353
Observations of Struve double stars	P7:153
HUTCHINS, C. C., Determination of the eccentricity of a sextant	P11:353
magnifying power of eye-pieces	S8:326
Pair of ancients	S10:214
Platinum on glass mirrors	A3:858
Ptolemaic and Copernican systems of Galileo	P12:442
Quartz fibre	S9: 90
ILIFF, E., and L. WATERBURY, Group of time stars for amateurs	P2: 74
INNES, R. T. A., On interpolation	P9:389
IRISH, C. W., Total solar eclipse, 1889	S8:166
JACOBY, H., Astronomer's pole	P9:177
Astrophotographic chart	A2:117; P3:211
Cape of Good Hope observatory	P3:217
Faith and the fourth dimension	P16:298
German variation of latitude work	A1:471
Rees, John Krom	P16:639
JAMES, G. O., Professor Obrecht's catalogue	P16:432
Reducing time observations with an engineer's transit	P15:475
Time obtained with a surveyor's transit	P13:499
JANSSEN, J., Age of the stars	S7:202
Eclipse of May 6, 1883	S2:179
Theory of the sun, by A. Brester, Jr	A3:238

	Volume and Page
JENKS, A., Reversed curvature of the shadow of Saturn's rings	**S9**:255
JESSE, O., and W. FOERSTER, Night cloud observations requested	**A1**:859
JEWELL, L. E., Object glass grating	**A3**:44, 155
Scales of intensity for lines of solar spectrum	**A2**:815
JOHNSON, H. A., Dearborn observatory	**S7**:381
JOHNSTON, W. H., Criticism of "Faith and the fourth dimension"	**P16**:615
JONES, G. L., 7609 *τ Cephei*	**P9**:408
Persei Nova	**P9**:573
JONES, G. S., An alt-azimuth mounting	**S10**:506
Are there possible Martians?	**P9**:234
How to make a lens	**S10**: 68
Polishing and grinding a telescope mirror	**S9**:353
Position of north pole of Mars	**P10**: 55
Visibility of Mercury	**P9**:367
JOURDAIN, P. E. B., Results from principle of conservation of energy	**P13**: 36
KAPTEYN, J. C., Motion of nebulae near Nova *Persei*	**P10**:124
KAYSER, H., Spectra of comets	**A3**:204, 586
influenced by slit-width	**A3**:367
and C. RUNGE, Spectra of the elements	**A2**:802
KEDZIE, J. H., New theory of solar heat and gravitation	**S7**:438
KEELER, J. E., Central star of Ring nebula of *Lyrae*	**A1**:824
Chromatic aberration of telescopes	**A3**:157
Comet *b* 1893, (1893 II)	**A2**:650
Efficiency of spectroscopes for astronomical purposes	**S10**:433
Electrical contact apparatus for astronomical clocks	**S7**: 9
Jupiter occultations	**S8**:221
β Lyrae	**A2**:350
Magnesium spectrum an index to star temperature	**A3**:660
Modern spectroscope of Alleghany observatory	**A2**: 40
Nebular hypothesis	**A1**:567, 768
Occultation of Mars, Sept. 3, 1892	**A1**:831
Ring of light around Venus	**S1**:292
Rock-salt for polishing	**S5**:222
Saturn observed with Lick equatorial	**S7**: 79
spectroscopically	**P2**:443
Short focus camera an advantage in spectrum photography	**A3**:772
stellar spectrum photography	**A3**:857
Spectra of *Orion* nebula and *Orion* stars	**A3**:476
Spectroscope and some of its applications	**P1**:9, 102, 169, 200; **P2**: 20
Spectrum of Comet 1892 III, (Holmes)	**A2**:272
P *Cygni*	**A2**:361
nebulae	**S10**:264
Star spectroscope of Lick observatory	**A1**:140
Stellar spectra by Professor Lockyer	**A3**: 59
Time service at Lick observatory	**S6**:233
Translation of Scheiner's "Die spectralanalyse der gestirne," (E. B.	

	Volume and Page
KEELER, J. E., *(Continued)*	
Frost)	**A3**:688
Wave-lengths in spectrum of nebulae	**A2**:733
KELVIN, LORD, Sun's effect on terrestrial magnetism	**A2**: 74
KEYSER, DIRECTOR, Division errors of meridian circle	**S3**: 33
KIMURA, H., Six years' cycle of the polar motion, 1891-1902	**P12**:270
KING, J., Total eclipse of the sun, 1893	**A1**:863
KIRKWOOD, D., *Arcturus*	**P1**:248
Asteroid zone, Gaps in	**S3**: 6
Asteroids	**S6**:116; **A1**:785
and their relation to the planetary system	**P1**: 19
Asteroidal orbits	**S6**:169; **S8**:305
August meteors	**S1**:141
Comet 1866 and November meteors	**S4**:225
Commensurability of motions	**S4**:257
Heavenly bodies	**P1**:205
Meteoric astronomy	**A2**:385, 789; **A3**:188
Motions of Jupiter, Saturn and minor planets	**A2**:302
Origin of comets	**S6**: 77
Relation of aerolites to shooting stars	**S6**:248
short period comets to asteroid zone	**S7**:177
Stability of nebulous planets	**S4**: 64
KLOTZ, O. J., Alaska boundary survey	**P3**:348, 395
Latitude by elongation	**P3**:199
Transmission of time	**P15**:129
KLUMPKE, D., Measurements at the Paris observatory	**A2**:783
KNIGHT, W. H., Some telescopes in the United States	**S10**:393, 475
KONIG, E., Non-screen orthochromatic and panchromatic plates by bathing	**P15**:620
KRETZ, W. C., Stars in *Coma Berenices*	**P9**: 75
KREUTZ, H., Comets of the year 1906	**P15**:421
KRUEGER, A., Schoenfeld, Edward	**S10**:275
LAMASTER, W. H., Growth and magnitude of the sidereal heavens	**P3**:226
LAMB, A. M., Change of latitude	**S4**:129
Determination of latitude	**S5**:179
LANGLEY, S. P., Amount of atmospheric absorption	**S3**:267
Dust envelope	**S3**: 21
New Spectrum	**P9**:415
Observation of sudden phenomena	**S8**:291
Solar and auroral coincidence	**S1**: 55
Winlock, William C	**P4**:351
LANNEAU, J. F., Approach of sun-spot maximum	**P12**: 67
Eclipse phenomenon	**P9**: 67
Physics of shooting stars	**P13**:434
Source of the sun's heat	**P14**:410
Sparsity of the stars	**P15**:390

	Volume and Page
LANNEAU, J. F., *(Continued)*	
Sun-spots in July, 1903	P11:372
LARKIN, E. L., Leonids observed in southern California	P10: 16
Mount Lowe Railway observatory	P9:359
Stellar floor	P10:252
LAVES, K., Adjustment of the equatorial telescope	P8:424, 535; P9: 13
Ancient astronomical instrument	P8:492
Arc method for descriptive astronomy	P14:217
Attempts to replace Newton's law of gravitation	P5:513
Computing a planet's anomaly and radius vector	P16:189
Graphic method for lunar eclipses	P15:533
New light from old records	P14:276
LEAVENWORTH, F. P., Mercury surface undisturbed by earth tremors	A3:597
Parallax of O. Arg. 14320	A2:206
Personal error in position angle observations	S10:116
Proper motion of some double stars	S8: 77
Telescopes, large vs. small	S9: 47
LE CHATELIER, H., Temperature of the sun	A1:517
LEMAN, M., On a new pendulum escapement	A2:882
LÉON, L. G., Leonids observed in 1902	P11: 53
Mars and Saturn, in conjunction	P12:147
Moon observations	P11:276
Solar activity	P12:66, 284
Sun-spots in December, 1903	P12:216
Venus and Jupiter in conjunction	P11:160
LEONARD, W. L., Drawings of Mars	P15:387
LEPPER, G. H., Nature of markings on Mars	P13:130
LEUSCHNER, A. O., Determining orbits from three observations	P13:296
LEWIS, E. P., and E. S. PERRY, Infra-red spectra of metals	A3:747
LINDSAY, T., Astronomical myths	P6:139, 405; P7:181
First lessons in navigation	P5:126
Occultation phenomena	P6:524
Science by co-operation	P4: 84
Theory of probability	P4:240
LIVEING, G. D., and J. DEWAR, Spectra of flames	A1:215
metallic compounds	A2:434
Spectrum of liquid oxygen	A1:705
LOCKYER, J. N., Photographic spectrum of *Orion* nebula	A3:574
Spectrum changes in *β Lyrae*	A3:575
Sun and his system	P9:123
LOCKYER, W. S. J., Magnetic storms, aurorae and solar phenomena	P11:552
LOEWY, M., *Eros* observations	P8:488
International astronomical conference	P9:393
Trépied, M. C	P15:519
LOOMIS, E. F., Meteors seen at Dumont, Iowa	P16:394
LORD, H. C., Solar disturbance	A1:738

Volume and Page

- LOVE, J. L., First college observatory in the United States S7:417
- LOWELL, P., Brontes, a study in Martian canal development P13: 1
  - Chart of faint stars visible at Lowell observatory P13:391
  - Double canals and separative powers of glasses P12:575
  - Expeditions for ascertaining observatory locations P11:144
  - Kind of eye needed for detecting planetary detail P13: 92
  - Manner of making the polar cap of Mars P11:369
  - Markings in Syrtis Major P4:289
  - Mars, Double canals of P5:234
    - North polar cap of P4:202; P15:416
      - Rifts and arctic canals on P10:113
    - photographed P13:479
    - Supposed signals from P10:185
  - Means of sharpening photographic image applied to Mars P15:612
  - Mercury P4:360
  - Micrometric measures of the diameters of Mars P3:287
  - Rotation of Jupiter P11: 1
  - Standard scale for telescopic observation P11:34, 218
  - Thoth and the Amenthes P13:251
  - Tores of Saturn P16:133
  - Transit of Mercury A3:865
  - Venus, 1903 .... P12:184
    - Rotation period and surface of P4:281, 389; P11:426
- LUMSDEN, G. E., Popular astronomical observatory P7:307, 371
- LYNN, W. T., Arago on Newton P12:626
  - Eclipse of Agathocles P13:201
    - Thales P9:577
  - *Sirius'* color in ancient times A1:634
  - Solar spots and their theories P14: 90
- MACDOUGAL, D. T., Life on other worlds P7:420
- MACPHERSON, H., Jr., Clerke, A. M P15:165
  - Construction of the heavens P14:385
  - Copeland, Ralph P14: 1
  - Distribution of the stars P15:400
  - Janssen, P. J. C P16: 72
  - Observatories of Scotland P15: 65
  - Scottish astronomy P14:206
  - Tacchini, Pietro P13:306
  - Two Scottish astronomers of to-day P16:397
  - Vogel, H. C P15:453
- MAHILLON, L., D'Arrest's comet S2:145
- MANIE, H. C., Red light S5:237
- MANN, N. M., 61 *Cygni* S2:18; S10: 13
  - Handy micrometer S3: 10
  - *Sirius* S2:136; S7:25; P4:482
  - Three interesting binaries S9:385

	Volume and Page
MANSON, M., Climate of Mars	**P2**:371
MARKWICK, E. E., Observation of variable stars	**P12**:193
MARTIN, E. S., Observatory for amateurs	**P1**: 93
MASCART, M., On aberration	**A1**:128
MASON, E. C., Life in other worlds	**P6**:520
MATZ, F. P., Stone, Ormond	**P3**:452
MAUNDER, E. W., Astronomy	**P14**:153
Progress of astronomy in 1906	**P15**: 1
Solar origin of terrestrial magnetic disturbances	**P13**:59; **P14**:228
Spectroscope in eclipse work	**P6**:376
Stars of the 1st and 2d type spectrum	**A1**:145
Sun-spot variation in latitude	**P12**:616
Triad of stars	**P16**:403
MAURY, A. C. De P. P., Corona seen after totality	**P8**:401
MAW, W. H., Work of the B. A. S	**P8**: 65
McBROOM, J. K., Star dust,—a discussion	**P11**:544
McCREARY, R. M., Celestial photography prophesied in 1840	**P6**:422
Facts and theories	**P4**:575
Illusion and its cause	**P7**: 11
Newspaper astronomy	**P6**:103
McFARLAND, R. W., Almanacs	**P2**:225, 358, 452; **P3**:114, 303
Ancient eclipses and chronology	**P7**:510; **P9**:176; **P10**:172
Astronomical and historical chronology, (W. L. Jordan)	**P13**:112
Calendar	**S10**:129, 247; **P16**:389
Chronological notes	**P3**:441; **P4**:63, 194, 233, 353, 391, 529
Gravity on the surface of the planets	**S2**:150
Julian period	**P14**: 98
Lunar cycle	**P14**: 27
Mars and Pyrois	**P2**:238
Miscellany	**P13**:531
New era at hand (Mr. Dimbletz)	**P3**:486
Solar cycle	**S8**:353
McKENNEY, A. P., What women have done for astronomy in the U. S	**P12**:171
McLEOD, R. R., Ahaz and sun-dials	**P7**:108
McPIKE, E. F., Bibliography of Dr. Edmond Halley	**P13**:579; **P14**:425
Halley's comet	**P12**:685; **P13**:471
Remarks on Dr. Halley	**P12**:453
MEE, A., Webb, Thomas William	**P13**:138
MEES, C. E. K., and S. H. WRATTEN, Filter Yellow K	**P14**:572
METCALF, J. H., An amateur's observatory	**P14**:211
Comet Morehouse	**P16**:655
Telescopic meteors	**P15**:29; **P16**:588
MEYER, M. W., Formation of rings a process of disintegration	**A2**:407; Cor. **A2**:765
MEYER, W. F., and R. T. CRAWFORD, Jupiter's satellite VIII	**P16**:491
MICHELSON, A. A., Comparison of meter with wave-length of cadmium	**A2**:556

Volume and Page

MICHELSON, A. A. *(Continued)*
  Interference methods applied to spectroscopic measurements.........A1:884
  Light waves and their application to metrology..........A3: 92
  and E. W. MORLEY, Earth and luminiferous ether..........S6:306
    Wave-length of light a standard..........S8:241
MILES, J. W., Auroral arches..........P16: 65
  Meteorite in Lancaster county, Pa..........P16:458
MILLER, A. F., Observation of a solar prominence..........A1:614
MILLER, E., Astronomy in high schools..........P3:161
  Corona of the sun seen without an eclipse..........P8: 80
  New theory of the surface markings of the moon..........P3:273
  Where did Mars get its moons?..........P4:424, 499, 573
MILLER, J. A., Comet Morehouse, (1908 *c*)..........P16:653
  Perseids of 1899..........P7:406
MILLIS, F. E., Leonid meteors, 1898..........P7: 47
MINCHIN, G. M., Photo-electric cells..........A1:702
MITCHELL, M. E., An astronomer's reverie..........P6:564
MITCHELL, S. A., Moon hoax..........P8:256
MITCHELL, W. M., Aurora of August 21, 1903..........P11:541
  Level of sun-spots..........P13:392
MONCK, W. H. S., Absorption of light in space..........A2:107
  Astronomical theory of the ice age..........S6:57, 193; S8:193
  Average parallax of the stars..........S8: 62
  Comets De Vico and Finlay..........S6:221
  Dissipation of comets..........S7:239
  Distribution of heat on the sun..........A3:823
      stars..........S7:20, 73, 105, 236; S10:409, 453
  Double stars..........S8:243
    Distances of..........S7:290
  Early conjunction of planets..........P8:238
  Eclipse cycle..........P10:240, 276
    of Thales..........P10:127
  Eclipses, Ancient..........P11:131, 242
  Ether and gravitation..........P1:409
  Fixed stars..........P1:195, 300, 385; P2:60, 108; P3:62; P4:259; P5:467
  Meteor comets..........S8:208; S9:216; A1:274
    orbits..........S10:328
    radiants..........S9:363, 454; S10:109, 126, 295, 300; A3:344
  Meteors and meteorites..........S8:395
    Celestial phenomena explicable by..........S9:260
  Meteorites or aerolites..........P11:357, 522
  Motion of sun and stars in space..........P10:307; P16:239
  Non-Euclidean geometry..........P8:333; P9:370
  On an infinite universe..........P16:596
  Proper motion of the stars..........A1:874
      and spectra of the stars..........A1:389, 700; A2:8, 513

Volume and Page

- MONCK, W. H. S., *(Continued)*
  - Relative albedo of planets **A1**:776
  - Solar heat and gravitation **S7**:440
  - Spectroscopic observations on binary stars **S9**:289
  - Systematic motions of stars and the galaxy **P14**:419
  - Variables of the Algol type **P5**:559
  - Venus' rotation period-gravitation **P5**:168, 273
- MORGAN, H. A., Comet *a* 1906, (1905 VI) **P14**:191
- MORGAN, H. R., Effect of temperature upon constants of a transit circle **P14**:452
- MORLEY, E. W., and A. A. MICHELSON, Earth and luminiferous ether · **S6**:306
  - Wave-length of light a standard **S8**:241
- MOREUX, Th., Great sun-spot, February, 1905 .... **P13**:194
- MORRIS, L. N., Allen, Richard Hinckley **P14**:592
- MORRISON, J., Roberdeau Buchanan and the doctrine of limits **P13**:472
  - Eclipses **P4**:308, 502; **P5**:29, 129, 368
  - Ephemerides, astronomical **P2**:301
    - Lunar **P3**:362, 467
    - Planetary **P4**: 32
    - of satellites **P6**:165
      - Saturn's rings **P6**:389
    - Sidereal **P4**: 90
    - Solar **P2**:406; **P3**:25, 86
  - General perturbations and the perturbative function **P8**:309; **P9**:130, 249, 436
  - Occultations **P5**:417
  - Orbit of comet Barnard, 1886 .... **S5**:118
  - Sidereal day **P15**: 12
  - Source and maintenance of solar energy **P10**:409
  - Star of Bethlehem **P11**:88, 122
  - Sun-dial of Ahaz **P6**:537; **P7**:368
  - Transits of Venus and Mercury **P5**:536
- MOSELEY, E. L., Meteor of Sept. 15, 1902 .... **P12**:190
- MOULTON, F. R., Binaries measured by the use of spectroscope **P3**:337
  - Professor Chamberlin on the nebular hypothesis **P5**:508
  - Geology, (Chamberlin and Salisbury) **P14**:327
  - Graphical method for elements of a parabolic orbit **P7**:193
  - Kepler's equation, Important method of solving **P3**:136
  - Motions of the planets **P11**:284
  - Perturbations of the heavenly bodies **P6**: 88
  - Problem of three bodies **P5**:407
  - Spheres of activity of the planets **P7**:281
  - Teaching general astronomy **P4**:400
  - Time **P12**:391
- MOULTON, M. E., Eclipse in India, Jan. 22, 1898 .... **P6**:121
- MOREAUX, M., Magnetic perturbations of Feb. 13 and 14, 1892 .... **A1**:318
- MOYE, M., Total solar eclipse of May 28, 1900 .... **P8**:368
  - August 30, 1905 .... **P13**:523

	Volume and Page
MULLER, F., Observations of nebulae	S6:361
MULLER, G., Preparations for new variable star catalogue	P11:138
MUSSON, W. B., New telescopes and other optical instruments	P8:378
MYERS, C. E., Equation of the ellipse through five points	S9:268
MYERS, G. W., Astronomical work at Munich	P4:229
Illinois university observatory	P6:319
Observations of Bielids, 1899	P8: 13
Light changes of β *Lyrae*	P6:268
Light fluctuations of variables	P6: 7
NEVILL, E., Ancient eclipses of the sun	P14:616; P15: 32
NEWALL, H. F., Combination of prisms for stellar spectroscope	A3:309
NEWCOMB, S., Aspects of American astronomy	P5:351
Astronomical clocks	S3:206
Eclipse of Agathocles	P13:199
Measures of the velocity of light	S5:15, 68
Philosophy of hyperspace	P6:380
Place of astronomy among the sciences	S7:14, 65
Theories of celestial motions	S2:11, 33
NEWKIRK, B. L., Watson asteroids	P12:645
NEWTON, H. A., Capture of comets by planets	A1: 12
Cometary shooting stars	A3:196
Loomis, Elias	S9:241
Meteorites, meteors, and shooting stars	S6:65, 98, 127
NIPHER, F. E., Positive photography with reference to eclipse work	P9: 24
NITSCH, A. W., Astronomy and civilization	P4:206
NOBLE, W., A night with *Orion*	P4:428
NUMSEN, W. H., Comet 1883 I	S3:81, 110
Nova in *Andromeda*	S5: 51
Variation of	S4:278, 301
NUSL, Fr., and J. FRIC, Communication about the diazenital	P13: 16
NYREN, M., Struve, O. W	P14:352
O'HALLORAN, R., Eclipse of June 28, 1908	P16:516
Light curves of *Mira* and W *Lyra*	P15: 95
Milky Way as it appears in the autumn heavens	P10:372
Philippine firmament	P7:201
R and S *Scorpii*	P4:275, 331
Solar cycle, Details of the recent	P12: 27
Stars that periodically glow and fade	P11:294
Study of solar surface	P16:484
Sun-spot maximum and minimum	P4:570; P6:478; P14:368
OMORI, F., Seismic motion and other phenomena	P14:543
PACKER, D. E., New variables near 5 M *Librae*, cluster	S9:381; S10:107
Solar corona photographed in daylight	P3:361
PANNEKOEK, A., Best method of observing the Milky Way	P5:524
Necessity of further researches on the Milky Way	P5:395
New charts for inserting the Milky Way	P5:485

	Volume and Page
PARKER, D. G., Are other planets inhabited?	P10:357
Dual observatory	P14: 96
Saturnian system	P12:405
PARKHURST, H. M., Cause of refraction	S10: 16
Diffraction	S5:200
Equatorial telescope	S7: 38
How to measure the invisible	S9:406,442
Instrumental photometry	S5:230
Obliteration from illumination	S7:337
Photometric observations of asteroids	S6:353
Stellar photometry	S4:273; A3:652
Summation of co-ordinates	S5: 53
Temporary stars	S6:118
PARKHURST, J. A., Astronomical photography with reflecting telescopes	P14:449
Comet 1889 V in Jupiter's satellite system	A2:856
Comparison stars for Nova *Geminorum*	P11:328
Mira	P3:165
Parkhurst, Henry M	P16:231
R and S *Scorpii*	P4:331
Variable, A new kind of	P3:214
star 7792 SS *Cygni*	P6:156; P7:138
North Circumpolar	P4:369, 419
Long period	P2:215, 316, 415
Stars	P1:125, 161, 212, 263, 315, 358, 397, 460; P2: 95
Variable Stars	P1:125, 161, 212, 263, 315, 358, 397, 460; P2: 95
PARR, W. A., Vatican observatory	P11:497
PARTRIDGE, E. A., and H. C. WHITAKER, Galileo's work on Saturn's rings	P3:408
PAUL, H. M., Stars of the *Pleiades*	S3:161
PAYNE, W. W., Alvan Clark and Sons corporation	P15:413
Amherst college observatory telescope	P11: 22
An *Aldebaran* occultation	P14:103
Astronomical work in progress	S6:350; S9:101; A2:102; P6:313, 395; P9:445; P11:182, 363; P12:45, 89; P15: 72
Astronomy of the nebulae	P9:490
Attraction and figure of the earth	P8:177; P9:7, 117
Bruce, C. W.	P8:235
Clark, Alvan	S6:250
Color of the sky	P14: 5
Comet Holmes	A2: 18
b 1893, (1893 II)	A2:596
b 1902 (Perrine) (1902 III)	P10:477
Comets and comet families	P6:1, 70, 143, 228
Crossley reflector in America	P8:4, 510
Culture value of mathematics and astronomy	P12:585, 633

Volume and Page

PAYNE, W. W., *(Continued)*
  Distance and constitution of the sun........**S7**:100
  Distances of the stars........**P1**:129
  Eclipse of Jan. 1, 1889........**S8**: 64
      May 28, 1900........**P8**:370
  Eclipses, Mathematical theory of........**P12**:515
  Explanation of researches on ancient eclipses........**P14**: 86
  Extent of the starry heavens........**P11**:411
  Free public observatories........**A3**:110
  Goodsell observatory's meridian circle........**S6**:302
  Greenwich astrographic work........**P12**:651
  Growth of worlds........**P6**:346, 401; **P7**:124
  Honor to Dr. Lewis Swift........**P5**: 96
  How the telescope aids ordinary vision........**P3**: 81
  Illustrations from astronomy........**P9**:151
  Is helium terrestrial........**P3**: 16
  Jupiter's family of comets........**A2**:800; **P1**:25, 62; **P14**:221
      satellites, Markings of........**P14**:608
  Kirkwood, Daniel **P1**:167
  Latitude variation **P12**:662
  Leonid meteors in 1899........**P7**:475, 524; **P8**: 15
      in 1901 ....**P9**:559
      Orbit of **P8**:523
  Lick observatory telescope........**S9**: 97
  Local observatory patronage........**S8**:452; **S9**: 65
  Lowell observatory work........**P8**:448
  Manual of Astronomy (C. A. Young)........**P10**:394
  Mare Crisium **P11**:130
  Mathematics needed for professional astronomy........**P15**:493, 600
  Mills expedition from Lick observatory........**P15**:522
  Moon........**P1**:16, 289; **P2**:67; **P3**:176; **P4**:143, 242
    Photographic atlas of the........**P11**: 25
  Motion of the north pole of the earth on its surface........**P14**:513
  N. Y. observatory and nautical museum........**P14**:349, 380
  Observations for beginners........**P3**:14, 121
  Observatory at Jeypore, India........**P11**:542
  Pearsons, Dr. D. K., the Christian philanthropist........**P12**:345
  Period of *Algol*........**P10**: 25
  Personal equation machine........**S10**:139
  Photographing the solar corona in 1900........**P7**:516
      sun **P2**:116
  Photography and the figure of the sun........**P13**:475
  Planet *Eros*........**P7**:20; **P8**:445
    Mars........**P3**:345, 385; **P15**:539
      and its canals........**P12**:365
    Mercury **P7**:466

Volume
and Page

PAYNE, W. W., *(Continued)*
Pleiades **P1**:456
Present knowledge of the sun **P12**:293
Radiant points of meteoric showers **P7**:337
Recent discoveries of satellites by Americans **P13**:120
Representative stellar spectra, (Sir Wm. and Lady Huggins) ... **P8**:323, 365
Revised general astronomy, (C. A. Young) **P6**:461
Rockwell, Charles H **P12**:262
Rosse, The Earl of **P16**:570
Size of the stars **P14**:164
Solar and terrestrial physical processes **P11**:374
vortices **P16**:555
Star of Bethlehem **S6**:265
names and their meanings, (R. H. Allen) **P7**:427
Study of astronomy **S8**:310, 407; **P4**:57, 116, 495; **P8**:29, 75, 136, 247
Swasey range finder **P12**:450
System of the stars, (A. M. Clerke) **P14**: 71
Systematic study of aurorae **A2**:602
Telescope care **P13**:506
for the high school, Small **P11**:429, 491; **P12**:546, 608
Trails of stars near the north pole **P12**:265
Two important books **P10**:465
U. S. Naval observatory **P7**:365, 459; **P10**:14; **P11**: 57
Report of visitors to **P9**: 71
Special time signal from **P12**:613
Variable stars **P8**:247
Yerkes observatory **P5**:115, 340; **P14**:458, 527
telescope **P1**:176

PENCE, J. B., Visualizing earth's motion **P2**: 46

PERKINS, C. A., Polarization of undiffracted red radiations **A2**:847

PERRINE, C. D., Comet *e* 1895, (Perrine) (1895 IV) **P3**:245, 279
h 1898 (Perrine) (1898 IX) **P6**:513
Keeler, James E **P8**:409
Leonid meteors of 1898 .... **P6**:553
Motion in nebula surrounding Nova *Persei* **P10**: 9
Origin of a disturbed region in corona **P10**:398
Rediscovery of comet Holmes, 1899 *d* **P7**:340
Tempel$_2$, 1899 *c* **P7**:291
Search for intra-Mercurial planet at eclipse, 1900 .... **P10**:460
Star's position obtained from a photograph **P15**:259
and W. W. CAMPBELL, Announcing satellite discoveries **P14**:135, 252

PERRY, S. J., Sun's chromosphere **S4**: 51

PICKERING, E. C., Address at Liverpool **S2**:281
Aims of an astronomer **P14**:583
Algol variable +45°4101 .... **P10**:362
Mme. Ceraski's second **P8**:162

PICKERING, E. C., *(Continued)*	**Volume and Page**
Algol stars, Early observations of	**P10:**195
Asteroid orbit of great eccentricity	**P10:**23
Astronomical photography	**S2:** 50
Bruce photographic telescope	**S8:**304; **P4:**531
Close binary stars	**S10:** 5
Common's 60-inch telescope	**P12:**660; **P13:** 70
Comparison stars for variables	**P6:**125
Constitution of the stars	**A2:**718
Co-operation in observing variable stars	**P9:**148
Distribution of energy in stellar spectra	**A1:** 22
Endowment of astronomical research	**P12:**472
Eros, (Witt's planet DQ 1898)	**P6:**530; **P7:** 66
Opposition of	**P8:**350; **P11:**501
Positions in 1893, 1894 and 1896 of	**P8:**405
Growth of Harvard observatory	**P8:** 89
Intensity of spectral lines	**P11:**384
Large southern telescope	**A1:**783
Leonid meteors	**P7:**412
Magellanic cloud	**P5:**411
Measurement of photographic intensities	**P8:**328
Missing asteroids	**P11:**181
Motion of stars in the line of sight	**P4:**306
Mountain observatories	**S2:**105
Nova *Aquilae*	**P8:**405
Aurigae	**A1:**228, 417
Centauri	**P3:**380
Geminorum before its discovery	**P11:**261
Normae	**A3:** 40
Persei, No. 2	**P10:**546
Sagittarii	**P7:**504
Objective prism	**A1:**199
Occultation of 26 *Arietis* observed photographically	**P6:**110
Photographic determination of stellar motions	**A3:**521
spectrum of the aurora	**P6:**308
Photographs of faint stars	**P15:**171
Planetary nebulae	**S1:**139
Polarizing photometers	**P6:** 60
Proposed Durchmusterung of variable stars	**P14:**508
Red stars near Nova *Velorum*	**P16:** 63
Reflecting telescope, 24-inch	**P13:**224
Spectrum of lightning	**P10:**104
β Lyrae	**A1:** 25
a meteor	**P5:**442
ζ Puppis	**P9:**222
Satellite of Saturn, New	**P7:**233

	Volume and Page
PICKERING, E. C., *(Continued)*	
Spectroscopic binary *μ' Scorpii*	P4:273
Standard stellar magnitudes	P15:303
Star A. G. C. 6886 having large proper motion	P13:503
Stars having peculiar spectra	P4:107; P6:363
Supposed variable Y *Aquilae*	P6:418
Variability in the light of *Eros,* (433)	P9:290, 358
Iris (7)	P12:258
Variable star clusters	P3:197; P5:276; P6:505
U *Pegasi*	P6: 29
U *Vulpeculae,* and ST *Cygni*	P7:208
stars, New	P14:160; P15:617
of short period	P6:262
in *Orion* nebula	P12:332
Wedge photometer	S1:105
Work for large telescopes	A2:114
PICKERING, W. H., Climate as related to astronomical observations	P3:464
Comet *c* 1905, Rotation of, (1906 I)	P15:100
Drawing ellipses	P16:147
Earthquake, February 23, 1892	A1:470
Eclipse of the moon, 1906	P14: 3
sun, 1889	S8:337
May, 1900	P8:225, 289
Error in the American ephemeris	P9:373
Explanation of the gegenschein	P8: 1
Jupiter and its satellites	A2:193, 390; A3:728, 423; P2:121
Jupiter's outer satellites	A2:481
Leonids	P10:400; P11:6; P12:530
Meteoric shower of Nov 13, 1897	P6:294, 326
Non-appearance of the Leonid shower	P7:395, 523
Period of revolution of the Leonids	P10: 8
Lunar atmosphere	P8:205
and occultation by Jupiter	A1:778
changes during eclipse, 1899	P8: 57
crack in the Valley of the Alps	P13: 64
observations by Dr. Klein criticized	P10:118
phenomena in October	P10:419
Observations of the formations of the moon	P10: 57
Mars	A1:668, 849; P13:305
Colors of	A1:449, 545, 632
Double canals of	P12:385
Observations of surface of	S9:369
Photographs of surface of	S9:254
Martian snows	P13:196
and lunar canals	P12:77, 439
Melting the polar caps of	A3:308

	Volume and Page
PICKERING, W. H., *(Continued)*	
Mountain station for Harvard observatory	**A1**:353
Neptune's position, how computed originally	**P14**:525
Nova *Persei,* Anderson's	**P9**:184
Novae *Aurigae* and *Normae*	**A3**:201
Occultation of Jupiter, 1889	**S9**:148
Origin of lunar formations	**P8**:147, 181
Orion nebula	**S9**: 1
Place of the origin of the moon	**P15**:274
Polar inversion of the planets and satellites	**A2**:692
Relation of the moon to the weather	**P11**:327
Saturn and its satellites	**A1**:649
Saturn's satellites IX and X	**P14**: 17
Schiaparelli's latest views on Mars	**A3**:632
Seas of Mars	**A3**:553
Spectrum of lightning	**P10**:104
Standard scale for telescopic observations	**P11**:113
Telescope mountings and domes	**A3**: 1
Variable stars in clusters	**P6**:505
PLASSMAN, J., True form of light curve of *Algol*	**A1**:419
PLUMMER, W. E., A Hindu astronomer	**P7**:244
Pritchard, Charles	**A2**:592
POINCARÉ, H., Milky Way and theory of gases	**P14**:475
POOR, C. L., Identity of comet Brooks 1889-1896-1903 with Lexell 1770	**P13**:178
Young, Charles A	**P16**:218
PORTER, J. G., Constant error in meridian observation	**P13**:117
Meridian circle at Cincinnati observatory	**S8**:3; **S9**: 46
Mitchel, O. M	**S8**:442
Motion of the solar system	**A1**:764
Proper motion of stars as criterion of distance	**P6**:549
Star of Bethlehem	**A2**: 6
Stars with annual motion of 1″ and over	**P8**:382
Telescope for Cincinnati observatory, 16-inch	**P12**:437
Time	**S6**: 95
POST, C. A., Balance roof for telescope buildings	**A2**:400
POYNTING, J. H., Astronomical consequences of pressure of light	**P15**:626
Mean density of the earth	**P3**:232
PREBLE, E. W., Comet envelopes	**S1**:280
PRESTON, E. D., Physical constants determined by U. S. C. & G. Survey	**P6**:101
PRITCHETT, C. W., Intersecting rainbows	**S7**:219
PRITCHETT, H. S., Equatorial like Lick's	**S5**: 65
Hall, Asaph	**P16**: 67
Total solar eclipse of April 15-16, 1893	**A1**:454
Washburn observatory	**S1**:126
PROCTOR, M., Corona and coronet days, (M. L. Todd)	**P7**:279
Evenings with the stars	**P4**:321, 374, 436, 515, 562

	Volume and Page
PROCTOR, M., *(Continued)*	
Eclipse expedition in 1905	P12:468
party in Africa	P4:445
Expeditions for eclipses, 1905	P13: 90
Making astronomy popular	P2:418
Stars and star telescopes (D. P. Todd)	P7:335
PUPIN, M. L., Electrical discharges through poor vacua	A1:483
Electro-magnetic theory of the sun's corona	A2:928
Observing solar corona without an eclipse	A2:362
QUIMBY, A. W., Dedication of Flower observatory	P5:112
Historic "Gregorian"	P5:482
Story of a speculum	P5: 26
RAMBAUT, A. A., Approximate solution of Kepler's equation	P14:423
RANYARD, C. A., Tails of comets	S2: 81
RAVENNE, G., New Planet	P6:558
RAYET, G., Temporary star in *Auriga*	A1:291
RAYLEIGH, LORD, Theory of stellar scintillation	A2:834, 921
READ, E. E., Jr., Solar prominences seen with grating spectroscope	S10:369
REED, T., Spectroscope in astronomy	P2:266, 297, 402; P3:141
study of variables	P3:333
Spectrum of sun in eclipse, 1893	A1:926
and C. A. YOUNG, Nova in *Auriga*	A1:289
REES, J. K., Chapel address, Jan. 8, 1902	P10:135
Leonids, 1898-1900	P9: 79
1901	P10:107
Rutherfurd, L. M	A1:689
Some facts about the minor planets	P6:339
Variation of latitude at New York, and constant of aberration	P8:169
RICARD, J. S., Meteorology on the Pacific slope	P16: 92
RICCO, A., Sun-spots and magnetic perturbations	A2: 33
RICE, H. L., Computing the daily motion of an asteroid	P14:287
Method applicable to problems solved by successive approximations	P13:370
RIGGE, W. F., Eclipse of Aug. 30, 1905, as visible in the U. S	P13:134
June 28, 1908	P16:271
Graphic construction of eclipses and occultations	P3:183, 247, 310, 353, 414, 454; P4:67, 123, 184
Hagen's astrophotographic journey, Father	P15:326
Heiss, Edward	P14:332
Jesuit astronomy	P12:9, 94, 230, 303, 375
Pope and the comet	P16:481, 656
Problems in orthographic projection on a sphere	P14:402
Schreiber's Jesuit astronomy	P12:9, 94, 230, 303, 375
Solar eclipse of June 3, 1908, visible in U. S	P15:610
Time of moonrise	P13:550
Transit of Mercury as visible in the U. S	P15:488
RIGGS, E., Easy way to make a noon-mark	P2: 73

Volume and Page

RITCHIE, J., Jr., Our knowledge of Mars........S9:450
ROBERTS, I., Photographic search for planet beyond Neptune........A1:554
ROCKWELL, C. H., Annular eclipse........S4:147
  Transit of Mercury........S1: 53
ROE, E. D., Jr., Sun observations at Syracuse university........P16:127
  Sun-spots in 1907........P15:447
  Wind forces on an observatory dome........P14:347; P16:424
ROGERS, W. A., Catalogues of stars reduced to a homogeneous system..S1:205
  Clark's new level........S1:210
  Constant of gravitation........P3:316
  Graduation of Harvard meridian circle........S3:306
  Index error of meridian circle........S2:138
  Ladd observatory dedicatory address........S10:491
  Methods of tracing constellations........S8:145
  Star catalogues, Common system of........S2:169, 204
ROLLINS, W., Long focus telescopes........A3:199
RORER, J. T., Need of revival of interest in astronomy in schools.....P14:340
ROWLAND, H. A., Gratings for optical purposes........S1:116
  in theory and practice........A2:129
  New table of standard wave-lengths........A2:320; Cor. A2:563
  Normal solar spectrum........S5: 85
RUBENS, H., and W. B. SNOW, Refraction of rays of great wave-length, A2:231
RUNGE, C., Dispersion of air........A2:426
  Law in the spectra of some of the elements........A3:128
  Line spectra of the elements........A1:496
  and H. KAYSER, Spectra of the elements........A2:802
RUNNING, T. R., Determining five Sundays in February........P11:218
RUSSELL, H. C., Chart of circumpolar stars........P4: 61
  Progress of astronomical photography........P2:101, 170, 310, 457
RUSSELL, H. N., Graphical method for elements of a double star orbit..P6:149
  Shadows cast by starlight........P10:242
  and Z. DANIEL, Venus as a luminous ring........P15:516
RUST, F., Computing $\phi - \phi'$ and ρ........P15:484
  Computing a planet's anomaly and radius vector........P16: 36
  Integral reduced by hyperbolic functions........P15:581
RYAN, T. C., Planet launching........P16: 17
  Solar apex........P15:205, 336
RYDBERG, J. R., Asymmetry in Rowland's concave gratings........A2:439
RYDZEWSKI, A., To find day of week on which any date shall fall........P7:416; Cor. P7:544
SADLER, H., Double stars 30 and 40 *Geminorum*........S5:218
  Table of stellar parallaxes........S9:342
SAFFORD, T. H., Astronomy in the U. S........S7:430; S8:70, 198
  Hanging levels attached to a portable transit........S9:433
  How to make good meridian observations........S10:113, 209, 401
  New star catalogue........S2: 88

	Volume and Page
SAFFORD, T. H., *(Continued)*	
Photography and meridian observation	S9:193
Problem of solar motion	A2: 1
Proper motion of Bradley's stars	S8:164
SAMPSON, W. T., Changes in Brooks' comet	S3: 44
SAUNDER, S. A., Sun-dial of Ahaz	P7:206, 444
SAWYER, E. F., Hints on observing meteors	S1:91, 150
SCHAEBERLE, J. M., Aberration of parabolic mirrors	P6: 38
Cometary structure in corona, 1893	A3:307
Corona on April 16, 1893	A2:217, 693, 730
Distances of the fixed stars	P15:412
Failure of reflecting telescope of large angular aperture	P5:315
Forty-foot telescope of Lick eclipse expedition	P1: 72
Mechanical causes of the sun-spots	A3:278
Nova *Arietis*	A1:751
Planetary photography with a reflecting telescope	P3:280
Region of Lacus Solis on Mars	P2:72; P3:644
Specter of the Brocken	S10:136
Star's image in field of a parabolic reflecting telescope	P6: 33
and A. L. COLTON, Parallax of a meteor determined by photography	P5:232
SCHEINER, J., Surface temperature of sun and stars	A3:569
SCHIAPARELLI, G., Mars	A3:632, 714
Tempel, William	S8:257, 329
SCHLESINGER, F., Apparent figure of the sky	P7:117
Some new astronomical instruments	P10:427
SCHUMANN, V., Hydrogen line in spectra of Nova *Aurigae* and vacuum tubes	A2:159
SEAGRAVE, F. E., Measures of the rings of Saturn	P11:145; P12:131
Observations of U *Orionis*	P12:145
Nova *Persei*	P10:47, 158
Saturn's equatorial diameter	P10: 54
SEARES, F. H., Art of numerical calculation	P16:349
Finding ephemerides for comet 1894 IV, (E. Swift)	P15:433
Obtaining time with the engineer's transit	P13:553
H. C. Wilson's list of *Algol* variables	P14:238
SEARLE, G. M., Astronomical photography of short focus lenses	A2:577
SEE, T. J. J., Age of the earth's consolidation	P15:545
Ages of the stars	P6:361
Aims of stellar astronomy	P5:194
Air waves observed through telescope	P5:479
Apex of the earth's way	P1:373
Apparent enlargement of sun and moon near horizon	P8:362
Astronomical observations at Flower observatory, (C. L. and E. Doolittle)	P14:393
Atmospheric conditions of central and southwestern U. S	P6: 65
Binary of 5½ years' period (β 883)	P5:245

Volume and Page

- SEE, T. J. J., *(Continued)*
  - Cause of the scintillation of the fixed stars **P5**:463
  - Doppler's principle applied to motion of binaries **A2**:812
  - Double star orbits derived by graphical process **A2**:581, 865
  - Eccentricities of the orbits of the binary stars **S10**: 65
  - Evolution of the double star systems **A2**:289
  - Explanation of the Egyptian Phoenix **A1**:457
  - History of the color of *Sirius* **A1**:269, 372, 550
  - Jupiter's satellites visible to the naked eye **P6**:257
  - Lane, Homer J **P14**:193
  - Lawton, George K **P9**:374
  - Locus of the center of gravity **A3**:627
  - Modern cosmogonies, (A. M. Clerke) **P14**:313
  - Orbit of *α Centauri* **A3**:256
    - Companion of *Sirius* **A3**: 82
    - ζ Sagittarii **A2**:510
  - Origin of stellar systems **S10**:179
  - Outline of the new theory of earthquakes **P16**:199
  - Propagation of the tidal wave **P8**:373
  - Recollections of Agnes M. Clerke **P15**:323
  - Refractor of Lowell observatory, 24-inch **P4**:297
  - Repulsive forces in nature **P10**:505
  - Rigidity of the earth **P16**:602
  - Roemer, Olaus **P11**:226, 461
  - Rotation periods of Venus and Mercury **P4**:533
  - Satellites with measurable disks, Dimensions of **P9**:471
  - Services of Nathaniel Bowditch to American astronomy **P2**:385
    - B. Pierce to American mathematics and astronomy **P3**: 49
  - *Sirius* in ancient times **P2**:193
  - Spiral nebulae, Significance of **P14**:614
  - Stability of the equilibrium of the oceans **P3**:178
  - Study of astronomy and educational ideals **P5**:429
    - physical astronomy **P2**:249, 289, 337
    - planetary detail **P4**:550
  - Temperature for gaseous celestial bodies, Law of **P7**:129
  - Why there are no mountains on Mars **P16**:255
- SEELIGER, H., General problems of celestial mechanics **P4**:407, 475, 545
  - Nova *Aurigae* **A1**:904; **A3**:142
  - On Newton's law of gravitation **P5**:474, 544; **P6**: 40
  - Quadruple star *ζ Cancri* **A3**:802
  - Stars in northern hemisphere **S4**: 33
- SERVISS, G. P., Among the stars with an opera-glass **S10**:244
  - New star in *Andromeda* **S4**:312
  - Sky from Pike's Peak **A3**:150
  - What a 5-inch telescope will show **P1**:372
- SEVERANCE, H. O., List of observatory publications in the U. S **P15**:517

	Volume and Page
SHEARMAN, T. S. H., Solar disturbances and terrestrial magnetism	**S10**:279
SHERMAN, O. T., Variation of the solar diameter	**A1**:513
SIDGREAVES, W., Bright solar prominence for 1891	**A1**: 66
Drawings of solar spots and faculae	**A1**:212
Nova *Aurigae*	**A1**:604, 882
Solar chromosphere, 1891 and 1892	**A2**:539
disturbances and magnetic storms	**A1**:817
Spectroscope for studying solar prominences	**A1**:136
Sun's physical constitution	**A2**:826
SIMONTON, T. D., Seen and learned abroad	**P12**:113, 338
SIRKS, J. L., Astigmatism of Rowland's concave gratings	**A3**:763
SKINNER, A. N., Eclipse expedition to Sumatra	**P10**: 1
SLIPHER, V. M., Spectrograms of Jupiter	**P11**: 1
SMITH, C. M., Stellar photometry	**P5**:117
SMITH, C. P., Sun-spot cycles and Scottish meteorology	**S8**:385
SMITH, D. E., Mathematical tablets of Nippur	**P15**:366
Movements in mathematical teaching	**P13**:205
SMITH, H. L., Telescopes of short focal length	**S1**:239; **S7**:293, 360
SMITH, T. B., Come learn of the stars	**S7**:213
SNELL, S. C., Packing instruments for transportation	**P8**: 88
SNOW, B. W., and H. RUBENS, Refraction rays of great wave-length	**A2**:231
SNYDER, M. B., A new method of transiting stars	**P10**:350
Physical phenomena of the transit of Mercury	**P16**:390
SPERRA, W. E., Additional observations of 43. and 45.1907 *Draconis*	**P16**:569
Discovery of comet *b*, 1893	**A2**:757
Graphical computation of the occultations of the star clusters	**P6**: 76
Night mirage	**P16**:164
Observations of short period variable stars	**P3**:404
Variable stars discovered in 1907, Some Harvard	**P16**:488
SPITTA, E. J., Compound wedge photometer	**S9**:163
Polarized reflections in Nicols' prism	**S9**:266
SPRAGUE, R., Star clusters	**P1**:407
STEBBINS, J., Determining heights by migrating birds	**P14**: 65
Observations of crater Linné	**P14**:510
STEIHEIL, A., Object-glasses for two lenses	**S3**:225
STINGLEY, L. L., Fireball of December 7, 1900	**P9**:426
STOCKWELL, J. N., Eclipse predicted by Thales	**P9**:376
STONE, O., Cincinnati observatory	**S1**: 56
Double star observing	**S1**: 95
Photographers vs. old fashioned astronomers	**S6**: 1
Telescopic illumination	**S6**: 73
STONEY, G. J., Importance of accurately observing the Leonids	**P4**:134
Spectroscopic determinations	**A1**:935
and A. M. W. DOWNING, Ephemerides for two situations in Leonid stream	**P7**:403
Perturbations of the Leonids	**P7**:227

	Volume and Page
STRONG, W., A three-inch telescope	P13:203
STRUTT, R. J., Radium and the sun's heat	P12: 75
STRUVE, O., Poulkowa double star work	S5:193
SWEZEY, G. D., Astronomy in our universities and colleges	P5:255
Earth before the earth-moon catastrophe	P15:397
SWIFT, L., "Accident comets"	P4:138
Astronomy in southern California	P6:516
Bailey's beads	S9:170
Comet Barnard 1884	P3: 17
Discovery of nebulae	A1:197
Double Meteors	S1:108; S8:454
Errors in astronomical text books	S8:160, 254
Intra-Mercurial planet	S2:122, 242
Lowe observatory	P3:465
Medals described	P9:505
Nebulae	S4:1, 36, 174; A1:566; P10:160
discovered at Lowe observatory	P5:426, 427; P6:18, 400
Nebulous ring	S9: 47
Right ascension circle, An automatic	S8:349
So-called ice age	P10: 88
Star of Bethlehem	A2:105
Star shower, Approaching	P7:415
Suggestions to amateurs	P1:30, 111, 157, 249, 369
Sun-dial of Ahaz	P10:278
Ups and downs of an astronomer	P9:476
Who discovered comet 1862 III?	P6:417, 562
TABER, R. B., Leonid Meteors of Nov. 1901	P10:403
TACCHINI, P., Distribution in latitude of solar phenomena	A1:134, 424, 711; A2:262, 425
Solar observations	A1:214, 520, 608, 710; A2:39; A3:244, 312, 503, 588
TATLOCK, J., Jr., Meridian circles	S3:275
Star catalogues compared	S3:246
TATNALL, R., Radiation of heated gases	A3:153
and H. CREW, Mapping spectra of metals	A3:741
TAYLOR, A., Eclipse photography	A2:267
TAYLOR, H. D., Triple achromatic object-glass	A3:696
TERBY, Dr., Physical observations of Mars	A1:478, 555
THOMAS, W. E., Law of the atmospheric strata	P11:196
THOME, J. M., National Argentine observatory	A3: 8
THOMPSON, G. A., Unusual discoveries of variable stars	P13:445
Variability and asteroids	P13:378
THORP, T., Diffraction grating replicas	P14: 93
TISSERAND, F., Satellite of Neptune	A3:291
TODD, D. P., Dimensions of small planets	A2:313
Early history of astronomy at Amherst college	P11:322
Laboratory methods in teaching astronomy	P8:467

	Volume and Page
TODD, D. P., *(Continued)*	
Lowell expedition to the Andes	P15:551
Prediction of fine seeing	S5:113
What eclipses of the sun teach us	P9:305
TODD, D. P., and R. H. BAKER, Predictions of the eclipse of Aug 30, 1905	P13:240
TOMKINS, H. G., Bright rays of the moon	P15:296
TONDORF, F. A., Kepler's attitude towards astrology	P12:299
TOWNLEY, S., Atmospheric conditions in the U. S	P6:188
TOWNLEY, S. D., Determination of time from single altitudes	P14:148
Time service at Washburn observatory	A1:467
TOZER, R. S., Tides of the comets	P13:489
TRAYLOR, M. C., Computation of an ephemeris of a planet or comet	P9:311
Opposition of *Eros*	P9:496
TRIER, B., Translations of Gauss and Bessel	P13:231
TROUVELOT, M. E. L., Changes on rings of Saturn	S4: 78
Fall of solar prominence into spot	A1:124
Phenomena observed in Saturn 1877-8	S10:74, 119, 171
TUCKER, R. H., Graduated corrections for fundamental observations	P14:321
errors of a divided circle	P11:523
Ultimate measurement of	P12:579
TURNER, A. B., Simple application of vectors	P16:408
TURNER, H. H., Astrographic chart and methods	P11:433
Common, Dr. A. A	P11:367
Corona of the sun	P14:548
Disturbances of June 17, 1891	A1: 67
Photography applied to astronomical research	P13:72, 122
TUTTLE, H. P., Comet 1846 VI	P6:561
Discovery of the planet Uranus	S8: 34
Limit of vision	S8:302
Lost periodic comet Tuttle-Schulhof, 1858 III	P6: 6
Search for Vulcan in 1860	P7:235
TYDEMAN, E. M., Chinese calendar	P10:335
New form of telescope	P8:464
Paraboloid speculum	P5:559
UPDEGRAFF, M., Calculating transits of Venus and Mercury	S10:225
UPHAM, W., Geological time	P14:264
UPTON, W., Ancient and modern observatories	S10:481
Constellation study	P1:1, 50, 115, 257, 308, 363, 391, 449
Ladd observatory	S10:502
Total eclipse of 1889	S8:118
VAN BIESBROECK, G., Stereoscope applied to astronomical researches	P12:318
VEBLEN, A. A., A bright meteor	P16:129
VEEDER, M. A., Aurora of March 30, 1894	A3:401
Concerted observation of aurora	P1: 22
Explanation of above phenomenon	P11:486

	Volume and Page
VEEDER, M. A., *(Continued)*	
Magne-crystallic action and the aurora	**P12**:182
Magnetic storms and auroras of Jan. 7-10, 1886	**A2**:449
Solar disturbances and terrestrial magnetism	**S10**:381
electro-magnetic induction	**A2**:264
origin of the aurora	**S8**:403
prominences	**S9**:279
Sun-spots and auroras, Relation between	**A1**:434
VENEN, L. P., Folk-lore astronomy	**P2**: 32
VENTOSA, V., Eclipse views at Burgos, Spain	**P14**:151
VERY, F. W., Distribution of moon's heat	**S10**:471
VOGEL, H. C., Nova Aurigae	**A1**:391; **A2**:896; **A3**:48, 66, 136, 150
Spectrum of iron as a comparison spectrum	**A1**:151
β Lyrae	**A3**:358, 561
Velocity of stars determined by spectrographic method	**A1**:203
VON BRANDIS, A., Transparent cosmic masses overweigh the stars	**P14**:162
VON GOTHARD, E., Small nebula at M 57	**A3**:190
Spectrum of nebulae and the new star	**A2**: 51
VON OPPOLZER, E., Brester's views on sun's atmosphere	**A3**:581
Contributions to solar physics	**A2**:736
Origin of sun-spots	**A2**:419
WADSWORTH, F. L. O., Comparison of methods of delineating surface markings of celestial objects	**P5**:200
Correcting and testing of parabolic mirrors	**P10**:337
Definition, delineating and resolving power of telescopes	**P5**:528
Double motion mechanism	**A3**:527
Electric controls for astronomical instruments	**A3**:265
Fixed-arm spectroscopes	**A3**:835
Mounting an equatorial axis on ball bearings	**A3**:723
New mirror for reflecting telescope	**P5**:518
WALL, E. J., Use of the spectroscope	**P14**:336
WALLACE, R. J., Astronomical secondary negatives and their originals	**P16**:159
Autochrom plate	**P16**: 83
WARNER, W. R., How and why of the Porro prism field-glass	**P10**:281
Problems in constructing large telescopes	**A2**:695
WATERBURY, L., and E. ILIFF, Group of time stars for amateurs	**P2**: 74
WATSON, I. I., Variable star U *Cephei*	**P10**:294
WEINEK, L., Photographic atlas of the moon	**P5**:240
WELD, L. G., Leonids observed at Iowa university	**P7**: 17
Students' observatory at Iowa university	**S10**:475
Tables for meridian elongation of *Polaris*	**S9**:269
WENDELL, O. C., Comet *d* 1907 (Daniel)	**P15**:622
Comets 1887-8	**S9**: 38
Euler's equation solved	**S9**:176
Halley's comet	**P16**: 71
Ephemeris of	**P16**:459

Volume and Page

WENDELL, O. C., *(Continued)*
  Meteor radiants **S4**:153; **S5**:152; **S6**:359; **P16**:517
  Orbits of meteors **S5**:111; **S7**: 37
WEST, R. H., Pronunciation of star names from Arabic **P2**:209
WETHERBEE, W., Terminator of Venus **P12**: 67
WHEAT, Q. A., Eclipse aid to chronology **P10**:19, 138, 207
WHITAKER, H. C., Observation data corrected by least squares **S9**:458
WHITAKER, H. C., and E. A. PARTRIDGE, Galileo's work on Saturn's rings **P3**:408
WHITELOW, E. T., Orientation of the field of view of a telescope **P15**: 22
  Spectroscope for small telescopes **P12**:363
WHITING, S. F., Drawings and globes in teaching astronomy **P13**:235
  Graphs in teaching astronomy **P13**:185
  Jupiter observations **P16**:457
  Photographs in teaching astronomy **P13**:430
  Spectroscopic work for classes in astronomy **P13**:387
  Whitin observatory of Wellesley college **P8**:482
WHITNEY, M. W., Comparison stars for variable 4.1903 .... **P11**:428
  Determination of the position of comets **P4**:177
    solar motion **P12**:226, 311
  Nova *Aurigae* observations **A1**:461
  Problem of solar motion **P5**:309
  Recent markings on Jupiter **A2**: 22
WILCZYUSKI, E. J., Sun's equatorial acceleration and sun-spots **P6**:209
WILLARD, C. R., Proctor, Richard A **P1**:319
  Time and time signals **P1**: 60
WILLIAMS, A. S., Jovian phenomena **P11**:361
  Red spot on Jupiter **P15**:560
  Remarks on Hough's article on Jupiter **P11**:188
WILSING, Dr., Sun's rotation determined by faculae **A2**:635
WILSON, D. T., A star-correction machine **P10**: 82
WILSON, H. C., Astronomical work at Goodsell observatory **P11**:179
  Astronomy with the small camera **P1**:26, 49
  Astrophotographic chart of the sky **A3**:260
  Celestial photography at high altitude **P12**:509
  Comet 1882 I **S3**:137
  Comet *b* 1882, (1882 II) **S3**: 1
  Comet 1884, II, Barnard's periodic **P2**:321
  Comet 1889 V **S9**:125
    Orbits of **A2**:793; **P1**:151
  Comet 1894 *e* (1894 IV) and the lost comet De Vico, 1844 I **P2**:241
  Comet 1908 *c* Morehouse **P16**:563
  Comet Halley, Next apparition of **P16**:265
  Comets 1844 I and 1886 V **S6**:121
    of 1887 .... **S7**:153
    1892 .... **A2**:121

	Volume and Page
WILSON, H. C., *(Continued)*	
Deviation of a falling body from the vertical	P5:186
Double star Σ 2145	A2:112
observation errors	S5:174, 211
Exterior nebulosities of the *Pleiades*	P7: 57
Great nebula in *Orion*	P1:433
Jupiter observations with 16-inch equatorial	A1:189
Leonid meteor shower	P6:568
Light curve of Nova *Persei*	P9:447, 479, 545; P10:31, 91, 144, 199, 257, 316
Mars observations at Goodsell observatory	A1:684
and his canals	S8: 13
Measuring distance of the sun, by *Eros*	P12:149
Meteoric shower of November	P6:502
Nebula in *Andromeda*	P7:507
Nebulous areas of the sky	P12:401
Nova *Geminorum,* 12.1903	P11:258
Nova *Persei*	P9:197; P10: 74
Number and distribution of the stars, near *Pleiades*	P15:193
Occultation of the *Pleiades,* Dec. 10, 1894	P2:176
stars in the *Hyades,* Dec. 20, 1904	P12:611
Our knowledge of comets	S5:257
Photograph of nebula HV 15 = N G C 6960	P10:432
Pleiades and two asteroids	P1:322
the sun	P8: 94
Photographing the Milky Way	P3: 58
Physical appearance of comet Holmes	A2: 31
Ring nebula in *Lyra*	P5:337
Rotation period of Saturn	P11:443
Spectrum of *Mira,* (*o Ceti,*)	P3:390
Strassburg observatory of the royal university	P5:171
Sun-spot of August 1894	P2: 49
observations, at Goodsell observatory	A3:293
Supposed satellite of Venus	S6:357
Total solar eclipse, January 22, 1898	P5:251
May 28, 1900	P8:240, 297
May 17-18, 1901	P9:267
Tycho Brahe's instruments at Prague observatory	P9:113
Variability of nucleus of *Andromeda* nebula	S10:520
Variable stars of the *Algol* type	P8:113
with different notation	P10:232, 312
short period	P14:75, 255
WILSON, W. E., Absorption of heat in the solar atmosphere	A1: 49
Photographic photometer for determining star magnitudes	A1:307
Thermal radiation from sun-spots	A3:378
and P. L. Gray, Effective temperature of the sun	A3:382
WINCHELL, N. H., Very brilliant meteorite	P12:553

	Volume and Page
WINLOCK, W. C., Bibliography of astronomical literature, 1890	S10:83, 356
Comets designated	S4:5; S5:50; S6:112
WING, D. E., Are other worlds inhabited?	P11:536
Star dust	P11:481
WOLF, M., Photographic observation of minor planets	A2:779
Photographing minor planets	A2:109
Solar statistics, 1892	A2:263
Stellar photography	A2:622
WOLFER, A., Revision of Wolf's sun-spot relative numbers	P10:449
WOOD, R. W., Invisibility of transparent objects	P11:202
WOOD, J. B., Case of the Leonids	P10:459
Geometrical consideration applied to the velocity of comets	P15:553
Newton's comet	P1:411
Velocity of comets	P13:140
WOOD, R. W., Invisiboility of transparent objects	P11:202
Orbit of bodies under action of a central attraction	P8: 32
WOODS, W. E., Solar prominence and reversal of the D_3 line	A3:159
WOODSIDE, C. L., Method of computing occultations	S5:203
WRATTEN, S. H., and C. E. K. MEES, Filter Yellow	P14:572
YENDELL, P. S., Flanery, David	P8:400, 484
Hagen's variable star atlas	P14:298
Observations of variable stars	P13:453; P14:537, 596
U *Pegasi,* variable star 8598	P3:400
Study of variable stars	P2:12; P3:446; P4:13, 536; P5:16, 84, 172, 235, 302, 399; P12: 32
Variable stars of short period	P2:160, 202, 269, 362
YOUNG, A. S., Leonids	P4:498
Sun-spot observations, 1900-1	P10:167
1902-3	P12:214
1904	P13:168
1905-6	P15:127
1907	P16:188
YOUNG, C. A., Address at Kenwood observatory dedication	S10:312
Adjustment of the spectroscope	P5:318
Andromeda, New star in	S4:281
Astronomical program for 1895	P2:308
Astronomy in 1876-1886	S6: 4
Bielid shower	P7:542
Chromosphere spectrum	A1:59, 162
Chronological notes	P4:451
Comet *b* 1882, (1882 II)	S1:187
Constant of gravitation	P3:382
Flexure of the axis of transit instruments	S2:101
Lane's law of increase of temperature in gaseous sphere	P7:225
Mars observed at Halsted observatory	A1:675
News from nebulae	S9: 27

	Volume and Page
YOUNG, C. A., *(Continued)*	
Pending problems of astronomy	**S8:**238, 257, 288
Recent papers on Dr. Huggins	**S8:**289
Red spot on Jupiter	**S4:**119
Rotation time of	**S5:**289
Small telescopes vs. large	**S5:** 1
Spectroscope at Halsted observatory	**A1:**292
Sun's constitution	**P12:**221
heat	**P6:**145
Supplemental notes for "The Sun"	**P5:**277, 332
Telescope for Halsted observatory	**S1:**131
Transit of Venus observations	**S1:**299
YOUNG, C. A., and T. REED, Nova *Aurigae*	**A1:**289
YOWELL, E. I., Is aqueous vapor present on Mars?	**P7:**237
ZIMMERMAN, W., On making negative enlargements	**P13:**484, 556

Index of Subjects

INDEX OF SUBJECTS

Volume and Page

- Aberration, *M. Mascart* **A1**:128
  - Constant of **P10**:220; **P11**:160
  - of light and solar prominences, *M. Fizeau* **A1**:126
  - Planetary, *R. Buchanan* **P13**:376
  - of telescopes, Chromatic, *J. E. Keeler* **A3**:157
  - and atmospheric refraction, *G. C. Comstock* **A3**:329
    - *M. Loewy* **P4**: 87
- Abroad, Seen and learned, *T. D. Simonton* **P12**:113, 338
- Absorption of heat in the solar atmosphere **A2**:463
  - light in space, *W. H. S. Monck* **A2**:107
- "Accident Comets," *L. Swift* **P4**:138
- Address of President of R. A. S., *A. A. Common* **P5**: 1
- Advancement of science, Function of criticism in, *F. H. Bigelow* **P7**:252, 292
- Aerolite in court **A1**:841
  - observed **S4**: 94
- Aerolites, Origin of **S9**:284
  - to shooting stars, Relation of, *D. Kirkwood* **S6**:248
- Ahaz and sun-dials, (See sun-dials of Ahaz).
- Air, Dispersion of the, *C. Runge* **A2**:426
  - waves observed through telescopes, *T. J. J. See* **P5**:479
- Airy's, Sir G. B., Ninetieth birthday, *Observatory* **S10**:392
- Alaska boundary survey, *O. J. Klotz* **P3**:348, 395
  - *R. J. Stein* **P3**:534
- Albedo of planets, Relative, *W. H. S. Monck* **A1**:776
- *Aldebaran,* Occultation of, *G. Davidson* **S6**:195
  - *H. A. Howe* **P13**:108
  - *W. W. Payne* **P14**:103
  - *L. D. Weld* **P14**:250
- Aldis' tables of $\frac{1}{2}(\theta - \cos\theta)$ **P10**:552
- *Algol,* Companion of, *J. E. Gore* **P12**:359
  - *J. R. Holt* **A3**:516
  - Minima of 1884 of, *C. W. Irish* **S3**: 14
  - Period of, *W. W. Payne* **P10**: 25
  - Spectroscopic observations of **S9**:237
  - stars, Early observations of, *E. C. Pickering* **P10**:195
  - True form of light curve of, *J. Plassman* **A1**:419
  - Variable star, *W. Ferrel* **A2**:429
    - + 45°4101, *E. C. Pickering* **P10**:362
  - and *β Capricorni, E. F. Sawyer* **S2**:311
- Allegheny observatory, *J. A. Brashear* **P8**:541, 565, 566
- Allen, Richard Hinckley, *H. S. Davis* **P14**:593
  - *L. N. Morris* **P14**:592
- Almanacs, *R. W. McFarland* **P2**:225, 358, 452; **P3**:114, 303

	Volume and Page
Almucantar	**S3**:285
A new, *A. E. Douglass*	**P11**:252
tests, *S. C. Chandler*	**S2**:269
Alt-azimuth mounting, *G. S. Jones*	**S10**:506
Amateurs, Suggestions to: *L. Swift*	
I Nebulae and comet seeking	**P1**: 30
II Great nebula in *Andromeda*	**P1**:111
III Great nebula in *Orion*	**P1**:157
IV Other wonderful nebulae	**P1**:249
V Nebulae and clusters	**P1**:369
American ephemeris, Error in, *W. H. Pickering*	**P9**:373
Amherst college observatory, New buildings at	**P12**:361
Andromeda, Anderson's variable in	**A3**:317
Nebula in, *J. E. Gore*	**P16**:325
L. Swift	**P1**:111
H. C. Wilson	**P7**:507
Dimensions of	**P16**:197
Photographs of	**S8**:141
Theoretical parallax of, *S. J. Corrigan*	**P16**:256
Variation in, *W. H. Numsen*	**S4**:278, 301
H. C. Wilson	**S10**:520
Parallax of λ	**P12**:431
Andromedae, γ, S. W. Burnham	**S10**:118
Nova, *E. E. Barnard*	**S4**:240
J. H. Eadie	**S5**: 79
W. H. Numsen	**S5**: 51
H. M. Parkhurst	**S6**:118
Disappearance of, *L. Swift*	**S5**: 59
Notes on	**S4**:246-8, 280, 285, 298, 308, 312, 316; **S5**: 90
Spectroscopic binary λ	**P15**:120
Spectrum of R	**S8**:429
Andromedes, (See meteors)	
J. M. Boraston	**A2**: 3
Angle-measuring instruments, *F. E. Harpham*	**P13**:149
Approximations, Methods applicable to problems solved by successive, *H. L. Rice*	**P13**:370
Aquarii, Nova (and *Delphini*), *M. Fleming*	**S10**:106
Orbit of Σ 2909, ε, *S. W. Burnham*	**P4**:474
Aquilae, Nova, *E. C. Pickering*	**P8**:405
Nova, No. 2, *E. C. Pickering*	**P13**:471, 513
η	**P11**:573
Supposed variable Y, *E. C. Pickering*	**P6**:418
"Triple cave" in, *M. Wolf*	**P10**:448
Arago on Newton, *W. T. Lynn*	**P12**:626
Arc, Trisection of the	**S8**:269
Archimedes, Recently found manuscript of	**P16**:392

Volume and Page

Arcturus, D. Kirkwood P1:248
  The great star P14:183
Argus, Orbit of 9 (β 101), *S. W. Burnham* A2:494; A3:290
  Spectrum of γ, *W. W. Campbell* A2:555
    L. A. Eddie P3:123
Arietis observed photographically, 26, *E. C. Pickering* P6:110
  Nova, *S. Glasenapp* A2:503
    J. M. Schaeberle A1:751
Asteroid, Computing daily motion of an, *R. T. Crawford* P14:397
    H. L. Rice P14:287
  orbit of great eccentricity, *E. C. Pickering* P10: 23
  zone, *D. Kirkwood* S1:129
    and ring of Saturn, *D. Kirkwood* S3: 6
Asteroids of 1891-1899 .... A1:627
  Companion, *W. H. S. Monck* S7:334
  Distribution of, *D. Kirkwood* S6:116
  Effects of collisions between, *S. J. Corrigan* A2:207, 304, 474
  Elements and notes:
    (1) Ceres A3:341; P11:207
    (2) Pallas A3:341
    (3) Juno P11:207
    (4) Vesta A3:341; P11:207
    (7) Iris P12:137
    (11) Parthenope P8:288
    (48) Doris P10:543
    (82) Alkmene P9:515
    (113) Amalthea P9:515
    (135) Hertha S2:314; P12:205
    (139) Juewa, *G. C. Comstock* S7:214
    (172) Baucis P9:570
    (175) Andromache P9:570
    (196) Philomena P9:275
    (206) Hersilia S4:115
    (209) Dido P9:159
    (212) Medea P8:516
    (228) Agatha S3: 57
    (235) Carolina S3: 27
    (236) Honoria S4:115
    (237) Coelestina S4:115
    (238) Hypatia S4:115
    (239) Adrastea S4:115
    (240) Vanadis S4:115
    (241) Germania S4:115; P9:515
    (242) Kriemhild S4:115
    (243) Ida S4:115
    (244) Sita S4:115

Asteroids, Elements and notes, *(Continued)*

		Volume and Page
(247)	Eukrate	P9.515
(265)	Anna	P10:154
(279)	Thule, *D. Kirkwood*	S8: 83
(281)	Lucretia, *W. C. Winlock*	S8: 42
(295)	Theresia	P8:516
(306)	Unitas	P8:559
(314)	Rosalia	P9:349
(334)	Chicago	P9:514; P10:154; P11: 47
(347)	Pariana	P10:154
(359)	(1893M) (1902 HS)	P10:438
(371)	Bohemia (1893 AD)	P10:381
(391)	Ingeborg (1894 BE)	P9:406, 459
(406)	Erna (1895 CB) (1903 LP) (1905 QU)	P13:567
(416)	Vaticana (1896 CS)	P10:494
(417)	Suevia (1896 CT) (1901 FN)	P11:567
(433)	Eros (1898 DQ) (See *Eros*).	
(434)	Hungaria	P8:217
(443)	Photographica (1899 EF)	P10:381
(444)	Gyptis, (1899 EL)	P8:561; P9:571; P10:267
(446)	Aeternitas (1899 ER)	P10:267
(449)	Hamburga (1899 EU)	P10:268
(451)	Payientia (1899 EY)	P8:102, 160
(453)	Tea (1900 FA) (1901 GS)	P8:217
(454)	Mathesis (1900 FC)	P9:514
(455)	Bruchsalia (1900 FG)	P10: 99
(456)	Abnoba (1900 FH)	P9:405
(457)	Alleghenia (1900 FJ)	P8:517
(458)	Hercynia (1900 FK)	P9:275
(459)	Signe, (1900 FM)	P8:559
(460)	Scania (1900 FN)	P8:559
(461)	Saskia (1900 FP)	P8:559
(462)	Eriphyla (1900 FQ) (1907 XL)	P8:559
(463)	Lola (1900 FS)	P9:275
(464)	Megaira (1901 FV)	P9:514
(465)	Alekto (1901 FW)	P10: 99
(466)	Tisiphone (1901 FX)	P9:514; P10: 99
(467)	Laura (1901 FY)	P9:514; P10:100
(468)	Lina	P10: 99
(469)	Argentina (GB 1901)	P10: 99
(470)	Kilia (489) (JO 1902)	P10:100; P12:137
(471)	Papagena (GN 1901)	P10: 99; P15:571
(472)	Roma (GP 1901)	P10: 99
(473)	Nolli (GC 1901)	P10:268
(474)	Prudentia (GD 1901)	P10:268
(475)	Ocllo (HN 1901)	P10:382

Volume
and Page

Asteroids, Elements and notes, *(Continued)*

(476) Hedwig **P10**:268
(477) Italia (GR 1901) **P10**:212
(478) Tergeste (GU 1901) **P9**:569; **P10**:268; **P11**: 96
(479) Caprera (HG 1901) **P10**:268
(480) Hansa (GL 1901) (QJ 1905) **P11**:208
(481) Emita (HP 1902) **P11**: 48
(482) Petrina (HT 1902) **P11**:208
(484) Pittsburghia (HX 1902) **P11**:208
(485) Genua (HZ 1902) **P11**:208
(486) Cremona (JB 1902) **P11**:208
(488) Kreusa (JG 1902) **P11**:452
(489) See (470).
(490) Veritas (JP 1902) **P11**:452
(492) Gismonda (JR 1902) **P11**:452
(498) Tokio (KU 1902) **P11**:452
(505) Cava (LL 1902) **P11**:568
(554) Peraga (PS 1905) **P13**:567
(555) Norma (PT 1905) **P13**:567
(556) Phyllis (PW 1905) **P13**:567
(557) Violetta (PY 1905) **P13**:567
(558) Carmen (QB 1905) **P13**:567
(559) Nanon (QD 1905) **P13**:567
(560) Delia (QF 1905) **P13**:567
(561) Ingwelde (QG 1905) **P13**:567
(562) Salome (QH 1905) **P13**:567
(563) Suleika (QK 1905) **P13**:567
(564) Dudu (QM 1905) **P13**:567
(565) Marbachia (QN 1905) **P13**:567
(566) Stereoscopia (QO 1905) **P13**:567
(567) Eleutheria (QP 1905) **P13**:567
(568) Cheruskia (QS 1905) **P13**:567
(569) Misa (QT 1905) **P13**:567
(581) Tauntonia (SF 1905) **P14**:174
H. A. Morgan **P14**:174
(588) Achilles (TG 1906) **P14**:303
FL 1900 .... **P8**:514
FO 1900 .... **P8**:559
FR 1900 .... **P8**:559
GA 1900 .... **P10**:100
GT 1901 .... **P10**:380
GV 1901 .... **P10**:100, 380
GW 1901 .... **P10**:380
GX 1901 .... **P10**:380
GY 1901 .... **P10**:380
GZ 1901 .... **P10**:380

	Volume and Page
Asteroids, Elements and notes, *(Continued)*	
HL 1901	**P10**:268
Gaps in the zone of, *D. Kirkwood*	**S10**:194
Groups of, *D. Kirkwood*	**A1**:785
Inclination of the, *D. Kirkwood*	**S8**:305
Missing, *E. C. Pickering*	**P11**:181
Photometric observations of, *H. M. Parkhurst*	**S6**:353; **A2**:570
Polarization of light of, *M. W. Harrington*	**S3**: 79
Recent, *D. Kirkwood*	**S4**:114
Trails of, *E. C. Pickering*	**P11**:153
Watson, *B. L. Newkirk*	**P12**:645
Watson's 22	**P12**:429
and their relation to the planetary system, *D. Kirkwood*	**P1**: 19
Asteroidal orbits, Inclinations and eccentricities of, *D. Kirkwood*	**S6**:169
Astral geometry, *G. B. Halsted*	**P9**:187
Astrolabe, *M. L. Huggins*	**A3**:793; **P2**:199, 261
Astronomer, (C. A. Young) *R. Bridges*	**P13**:172
Aims of an, *E. C. Pickering*	**P14**:583
Tools of the, *M. W. Harrington*	**S2**:248, 261, 297
Ups and downs of an, *L. Swift*	**P9**:476
"Astronomer's" globe, *A. E. Douglass*	**P5**: 57
pole, *H. Jacoby*	**P9**:177
reverie, *M. E. Mitchell*	**P6**:564
Astronomers vs. photographers, *O. Stone*	**S6**: 1
of to-day, *H. Macpherson, Jr*	**P16**:397
Wolf-Leavenworth collection of portraits of	**S9**:152
Women, *H. S. Davis*	**P6**:129, 211, 220
Astronomical achievement, (Extracts from address) *D. Gill*	**P15**:467
books for use of students, *H. A. Howe*	**P9**:29, 61, 169, 225
chart, An old, *W. H. Grainger*	**A1**:844
cipher messages	**S4**:161
clock correction	**A2**:284
Pond motor	**S8**:273
clocks, *S. Newcomb*	**S3**:206
Electrical contact apparatus for, *J. E. Keeler*	**S7**: 9
Make-and-break-circuit for, *W. R. Brooks*	**S7**:346
New escapement for	**A2**:761
conference, International, *M. Loewy*	**P9**:393
exhibition of Columbian exposition	**A1**:305; **A2**:641
facts and fallacies, *J. E. Gore*	**P16**:525
instrument, An ancient, *K. Laves*	**P8**:492
instruments, Standard dimensions in, *J. A. Brashear*	**S7**: 77
investigations, Value of photography for, *G. Clark*	**P9**:294
Journal by Flammarion, *E. S. Holden*	**S1**:103
library	**S1**:296
literature for 1890, *W. C. Winlock*	**S10**: 83, 356

Volume and Page

Astronomical, *(Continued)*
myths,—astrology, *T. Lindsay*..............................**P6**:139, 405
—planets and the weather, *T. Lindsay*..............................**P7**:181
observatory, *G. E. Lumsden*..............................**P7**:307, 371
photography, *Edinburgh Review*..............................**S7**:138, 181
. *E. C. Pickering*..............................**S2**: 50
Progress of, *D. Gill*..............................**P15**:528
H. C. Russell..............**P2**:101, 170, 310, 457
with commercial lenses, *W. Harkness*..................**A1**:641
portrait lens, *E. E. Barnard*..................**P16**:286
reflecting telescopes, *J. A. Parkhurst*............**P14**:449
short focus lens, *G. M. Searle*..................**A2**:577
research, *W. W. Payne*..............................**P12**: 89
Aid to, *E. C. Pickering*....................**S9**:473; **P11**:350; **P12**:472
secondary negatives and their originals, *R. J. Wallace*.............**P16**:159
society meetings:
(See also Observatory reports and publications)
A. A. A. S..
S1:122, 162; **S9**:380; **P3**:156; **P6**:185; **P7**:165, 444; **P15**: 64
A. & A. S. of A............**P10**:110; **P11**:104; **P12**:146, 287; **P14**: 63
Astronomical congress..............................**A2**:78, 640, 743
A. S. of P..
S8:358; **S9**:24, 106, 212, 296; **S10**:132, 254, 429; **A1**:256, 636; **A2**:478
A. S. of Toronto, **A1**:346, 637, 846; **A2**:95, 287, 383, 479, 575, 861, 939; **A3**:174, 262, 327, 418, 518; **P2**:192, 431, 473; **P3**:160; **P4**:110, 279, 530; **P5**:277; **P11**:55.
Baltimore A. S..............................**A1**:789; **A2**:575, 669
B. A. A........**S9**:456; **A1**:739; **P9**:576; **P12**:285; **P13**:226; **P14**:104
Camden A. S..............................**A1**:256; **A2**:287
Chicago Academy of Science, **A1**:635, 846; **A2**:94, 285, 477, 940; **A3**:87, 173, 262, 326, 419.
Croatian Physical Society..............................**P12**:289
New York Academy of Science......**A2**:285, 383, 478, 940; **A3**:88, 415
R. A. S..............................**P13**:577
R. A. S., of Canada..............................**P12**:630
Wanganui (New Zealand)..............................**P14**:122
text books, Errors in, *L. Swift*..............................**S8**:160, 232, 254
theory of the ice age, *R. W. McFarland*..............................**S6**:117
W. H. S. Monck.........**S5**:293; **S6**:57, 193; **S8**:193
molecule and an electronic theory of matter, *S. J. Corrigan,* **P15**:585; **P16**:25, 98, 148, 300, 367, 411, 493, 533, 619
work at Munich, *G. W. Myers*..............................**P4**:229
in progress, *W. W. Payne*..............................**P12**: 45
of 1895, *C. A. Young*..............................**P2**:308
1905, *A. C. D. Crommelin*..............................**P14**: 11
with inexpensive apparatus, *G. E. Hale*................**P16**:74, 167, 438

Volume
and Page

- Astronomy, *E. W. Maunder* …… **P14**:153
  - Address on, *A. A. Common* …… **P8**:417, 496
  - Amherst college, History of, *D. Todd* …… **P11**:322
  - Aspects of American, *S. Newcomb* …… **P5**:351
  - Current, *W. W. Payne* …… **P6**:395; **P9**:445; **P11**:182; **P15**: 72
  - in education, Place and function, *H. A. Howe* …… **P6**:371
  - 1876—1886, *C. A. Young* …… **S6**: 4
  - in 1889, *W. W. Payne* …… **S9**:101
    - 1890, *W. W. Payne* …… **S10**:133
    - 1893, *W. W. Payne* …… **A2**:102
    - 19th Century, *W. W. Payne* …… **S6**:350
    - 20th Century, *W. W. Payne* …… **P9**:286
    - 1906, *E. W. Maunder* …… **P15**: 1
    - 1907, *Science Year Book* …… **P16**:174
    - the High School, *M. E. Byrd* …… **P11**:550; **P12**:24, 199; **P13**:545; **P15**:227
      - *E. Miller* …… **P3**:161
      - *W. W. Payne* …… **S3**: 15
      - and college, Need of revived interest, *J. T. Rorer* **P14**:340
    - Russia, *S. W. Burnham* …… **A2**:595
    - southern California, *L. Swift* …… **P6**:516
    - U. S., *T. H. Safford* …… **S7**:430; **S8**:70, 198
      - What women have done for, *A. P. McKenney* …… **P12**:171
    - universities and colleges, *G. D. Swezey* …… **P5**:255
  - of the nebulae, *W. W. Payne* …… **P9**:490
  - Field for woman's work in, *Mrs. M. Fleming* …… **A2**:683
  - Folk-lore, *L. P. Venen* …… **P2**: 32
  - Foreign notices of American …… **S2**:72
  - Good books on …… **P13**:580
  - History of, *G. F. Chambers* …… **S10**:457
    - *H. S. Davis* …… **P6**:455
  - Illustrations from, *W. W. Payne* …… **P9**:151
  - Instruments and work of, *A. Hall* …… **S4**: 97
  - Laboratory course in elementary, *M. E. Byrd* …… **P14**:294
    - for general, *M. E. Byrd* …… **P10**:131
  - Neglected field of fundamental, *J. R. Eastman* …… **A2**:126, 315
  - Nippur excavations …… **P11**:111
  - Pending problems of, *C. A. Young* …… **S3**:238, 257, 289
  - Place of, *S. Newcomb* …… **S7**:14, 65
  - Plea for elementary, *M. E. Byrd* …… **P15**: 25
  - Popular study of, *M. E. Byrd* …… **S6**:151
    - *M. Proctor* …… **P2**:418
  - Popularized …… **A2**:376
  - of precision, Problems in, *G. C. Comstock* …… **P4**:457
  - Problems in sidereal, *J. Ennis* …… **S2**: 67
  - Recent, *W. W. Payne* …… **P6**:313; **P11**:363

Volume and Page

Astronomy, *(Continued)*
  Schreiber's Jesuit, *W. F. Rigge*.................... P12:9, 94, 230, 303, 375
  Scottish, *H. Macpherson, Jr*.................... P14:206
  of Shakespeare, *O. E. Harmon*.................... P6:232, 263, 321
  Sketch of theoretical, *A. Hall*.................... P5: 9
  with small camera, *H. C. Wilson*.................... P1:26, 49
  Spectroscopic work for classes in, *S. F. Whiting*.................... P13:387
  Study of, *W. W. Payne*...S8:310, 407; P3:377; P4:57, 116; P8:29, 75, 136, 247.
      with photographs, *W. W. Payne*.................... P4:495
      physical, *T. J. J. See*.................... P2:249, 289, 337, 384
  Teaching descriptive, *H. A. Howe*.................... P4:225, 363
      with arc method descriptive, *K. Laves*.................... P14:217
      general, *F. R. Moulton*.................... P4:400
      with drawings and globes, *S. F. Whiting*.................... P13:235
          graphs, *S. F. Whiting*.................... P13:185
          laboratory method, *M. E. Byrd*.................... P7:472
              D. Todd.................... P8:467
          photographs, *S. F. Whiting*.................... P13:430
  and civilization, *A. W. Nitsch*.................... P4:206
      educational ideals, *T. J. J. See*.................... P5:429
      geology, Untrodden ground in.................... A3:325
Astrophysical Journal, *G. E. Hale*.................... A1:17; A3:831
      Index.................... P16:453
"Autochrom" plate, *R. J. Wallace*.................... P16: 83
Atmosphere, *F. J. B. Cordeiro*.................... P13:384
  Effect of mountains on, *A. E. Douglass*.................... P7:354
  telescope and observer, *A. E. Douglass*.................... P5: 64
Atmospheric absorption, *S. P. Langley*.................... S3:267
  condition, *J. R. Hooper*.................... S3:230
  conditions of central and southwestern U. S., *T. J. J. See*.................... P6: 65
      S. Townley.................... P6:188
  strata, Law of, *W. E. Thomas*.................... P11:196
Auhagen's demonstration, *W. Auhagen*.................... P15:445
Aurigae, Radial velocity of β.................... P12:215
  Nova.................... A1:233, 249, 328, 330, 434, 828; A2:270
      E. E. Barnard.................... P2:307
      W. W. Campbell.................... A1:715,820; A2:149
      A. M. Clerke.................... A1:504
      R. Copeland.................... A1:593
      A. L. Cortie.................... A2:521
      Mr. and *Mrs. W. Huggins*.................... A1:571
      E. C. Pickering.................... A1:228, 417, 750
      G. Rayet.................... A1:291
      T. Reed and *C. A. Young*.................... A1:289
      H. Seeliger.................... A1:904, 929; A3:142

	Volume and Page
Aurigae, Nova, *(Continued)*	
W. Sidgreaves	A1:604, 882
H. C. Vogel	A2:896; A3:48, 66, 136, 150
M. W. Whitney	A1:461
C. A. Young and *T. Reed*	A1:289
disappearing, *H. C. Wilson*	A1:346
Measures in spectrum of	A3: 66
Motion of, *W. W. Campbell*	A1:881
H. C. Vogel	A1:391
a nebula, *E. E. Barnard*	A1:751
J. M. Schaeberle	A1:523
New outburst	A1:737, 934
and *Normae*	A3:201
Observations of	A2:174
W. W. Campbell	A1:715; A2:417
Spectrum of, *W. W. Campbell*	A2:722
H. Crew	A1:231
Mr. and Mrs. Huggins	A2:609
W. Huggins	A2:349
V. Schumann	A2:159
W. Sidgreaves	A1:882; Cor. A2:560
Visual appearance of, *W. Huggins*	A3:314
Aurora, *H. G. Blatchley,* Aug. 21, 1903	P11:578
J. M. Boraston, April 25, 1892	A1:521
C. S. Bryant	S1: 88
J. B. Coit, Aug. 21, 1903	P11:534
A. R. J. F. Hassard	P16:517
M. E. Hutton, Aug. 6, 1896	P4:276
W. M. Mitchell, Aug. 21, 1903	P11:541
F. E. Seagrave	A1:539
M. A. Veeder, March 30, 1894	A3:401, 779
Concerted observation of, *M. A. Veeder*	P1: 22
Solar origin of, *M. A. Veeder*	S8:403
and zodiacal light, *A. Harvey*	P10:332
Aurorae, Height of, *J. A. Copeland*	A3:506
Notes on	A1:173, 237, 249
sun-spots, and earth currents, *M. A. Veeder*	P1:479
Systematic study of, *W. W. Payne*	A2:602
Auroras, (See magnetic storms)	
of January, 1892, *M. A. Veeder*	A1:239
Observations in north Greenland of, *M. A. Veeder*	A3:779
sun-spots	S1: 98
and magnetic disturbances	A1:617
Aurora borealis, *A. R. J. F. Hassard*	P15:256
A. B. Hervey	P15:446
A. G. Zambrano	P15:576

Volume and Page

Aurora *(Continued)*
charging an electro-magnetic clock P12:288
Aurora-inclinometer, *F. H. Bigelow* S10:496
Auroral arch, Aug. 21, 1903 .... P12:218
O. A. Allen P12: 65
D. L. Stewart P12: 65
arches, *F. Campbell* P11:575; P15:448
A. R. J. F. Hassard P16:455
J. W. Miles P16: 65
A. W. Williamsen P11:578
phenomena, *D. E. Hadden* P10:249
or zodiacal light, *D. E. Hadden* P10:388
Awards of medals, prizes, etc.:
Arago medal A3:81; P1:336; P2:33
Astronomical Journal prize A2:283, 848; P2:471
society of Mexico, medals P15: 59
Boyden premium P7:80; P13:172; P15:515
Bredekhine prize P10:334
Carnegie institution fund P11:103
Funds for scientific research:
Anonymous P10:223
Carnegie institution P11:103
Gould P7:168; P9:276; P11:275
Hodgkins A2:560
Research endowment P12:472
Gwilt gift P5: 96
Janssen medal P2:331; P13:412; P14:446
Lalande prize S1:42, 46, 100; S2:131; A2:186; P12:361
Lawrence fellowship P13:350, 415
R. A. S. medals A3:169; P1:286; P13:172; P14:124, 254
R. P. S. awards P14:137
Rumford medal S2:160
St. Louis exposition medal P12:679
Warner astronomical prize ....
S1:21, 125; S3:58, 94, 124; S4:61; S5:123, 188; S6:225; S7:222; S8:372
Babylonian astronomy, Researches in A1:347
table of squares S2:317
Bailey's beads, *L. Swift* S9:170
Barnard, E. E., *S. W. Burnham* P1:193, 341, 441
Barometric pressure, Mean values of, *Solar physics committee* P16:549
Bessel's Log. B for great elevations, *H. P. Tuttle* S7:406
Biela meteors, (See meteors)
Binary pairs, Hypothetical parallax of, *E. S. Holden* S7:356
star, Orbit of companion of a, *J. H. Boyd* P3: 19
Binary stars (See double stars and spectroscopic binaries)
β 151, Orbit of β *Delphini, R. G. Aitken* P10:486; P11: 28

	Volume and Page
Binary, β 151, Orbit of β *Delphini, (Continued)*	
S. W. Burnham	S10:215
β 208, *S. W. Burnham*	A1:464
in periastron, *T. J. J. See*	P16:126
β 216, Orbit of	P11:576
β 395 = (82 *Ceti*), Orbit of new	PP5:329; P6: 59
R. G. Aitken	P13:190
S. W. Burnham	S5: 87
β 416 = (*Scorpii* 185), *S. W. Burnham*	S10:489; A2:792
S. Glasenapp	A2:402
β 612, Motion of, *S. W. Burnham*	S10:323; A1:268
S. Glascnapp	P15:648
β 733 = (85 *Pegasi*), Elements of	A2:187; P14:506
Orbit of, *L'Astronomie*	S3:213
β 883, 5½ year period of	P5:245
New measures of, *T. J. J. See*	P5:173
Σ 1687, Coma *Berenices* and O Σ 4, *S. W. Burnham*	P5:125
Σ 1785, Period of, *S. W. Burnham*	A2:397
Σ 1998 (ε *Scorpii*), Orbit of, *S. W. Burnham*	P13:472
Σ 2107, Orbit of, *S. W. Burnham*	P5:449
O Σ 82, *S. Glasenapp*	A2:759
O Σ 215, Orbit of, *S. W. Burnham*	P4:543
O Σ 224, *S. W. Burnham*	A1:661
S. Gascnapp	A2:702
Orbit of, *J. E. Gore*	A3:559
O Σ 285, Orbit of, *S. W. Burnham*	S10:273; A2:586
O Σ 535, Period of δ *Equulei, S. W. Burnham*	S2:244
Δ 15, Orbit of, *H. B. Evans*	P7:306
Close, *E. C. Pickering*	S10: 5
Density and figure of close	P9:461
Determining apparent orbits of, *C. P. Howard*	A3:425
discovered by T. J. J. See	P4:451
Eccentricities of the orbits of, *T. J. J. See*	S10: 65
Masses of, *S. M. Hadley*	P11:240; P13:260, 323
measured by the use of the spectroscope, *F. R. Moulton*	P3:337
Spectroscopic observations of, *W. H. S. Monck*	S9:289
systems, *S. W. Burnham*	P4:169
Binaries, Three interesting, *N. M. Mann*	S9:385
Binocular Porro prism	P11:279
telescope, Performance of a, *D. W. Edgecomb*	P10:523
Bode's law applied to satellites, *W. T. Lynn*	A2:895
Bologne, Italy, observatory, New	P15:257
Bolometer, History of the	A2:78, 465
work, Mr. Langley's progress in	A3: 41
Books, Two important, *W. W. Payne*	P10:465
Bowditch's, Nathaniel, services to American astronomy, *T. J. J. See*	P2:386

Volume and Page
Bradley's stars, Proper motion of, *T. H. Safford* ... **S8**:164
Brahe, Tycho ... **S4**: 86
  C. E. Furness ... **P3**:221
Brahe's death, Tercentenary of Tycho, *Nature* ... **P9**:565
  Instruments at Prague observatory, *H. C. Wilson* ... **P9**:113
  star, Place of Tycho, *S. W. Burnham* ... **S9**:449
Bright wire illumination for micrometers, *S. W. Burnham* ... **S1**:110
British astronomical society work, *W. H. Maw* ... **P8**: 65
Brooks' cometary mass, *W. R. Brooks* ... **S2**:149
Buchanan, Roberdeau, and the doctrine of limits, *J. Morrison* ... **P13**:472
Burnham on double stars, *G. C. Comstock* ... **S10**:277
Calculating machines, Some, *H. S. Davis* ... **P4**: 20
Calculus by means of finite differences, Differential, *R. Buchanan* ... **P13**:245, 309
Calendar, *R. W. McFarland* ... **P16**:389
  Chinese, *W. L. Hornsby* ... **P10**:229
  E. M. Tydeman ... **P10**:335
  Perpetual, *R. W. McFarland* ... **S10**:129, 247
Calendars, Ancient, *K. Laves* ... **P14**:276
California university proposed astronomical observatory ... **P6**:479
Camelopardalis, Nova, *M. Fleming* ... **S10**:152
Canals, Explanation of Martian and lunar, *W. H. Pickering* ... **P12**:439
  and separative powers of glasses, Double, *P. Lowell* ... **P12**:575
ζ *Cancri*, Quadruple stars, *H. Seeliger* ... **A3**:802
θ *Cancri*, Proper motion of ... **P11**:577
ξ *Cancri*, System of, *S. W. Burnham* ... **A2**:872
  A. M. Clerke ... **S9**:300
Capella, a visual double star, *H. C. Wilson* ... **P9**:109
β *Capricorni*, Occultation of ... **S3**:91, 150
Cartesian co-ordinates, Equation of, *H. H. Furness, Jr* ... **S9**:200
β *Cassiopeiae*, Companion to, *S. W. Burnham* ... **P8**:540
η *Cassiopeiae*, Orbit of ... **P9**:578
Castor, Orbit of, *S. W. Burnham* ... **P4**:286; **P12**:627
  Quadruple star, *W. W. Campbell* ... **P13**: 87
Catalogue of 130 polar stars ... **S6**:157
  1278 stars, *G. Davidson* ... **S3**:250
Catalogues of stars to a homogeneous system, *W. A. Rogers* ... **S1**:205
Celestial motions, Theories of, *S. Newcomb* ... **S2**:11, 33
  photographs, Comparison of ... **A1**:634
  photography ... **P14**:575
α *Centauri*, Orbit of, *T. J. J. See* ... **A3**:256
ω *Centauri*, *S. I. Bailey* ... **A2**:689
Centauri Nova, *E. C. Pickering* ... **P3**:380
Century, Twentieth, *J. Edmunds* ... **P8**:140
U *Cephei*, *I. I. Watson* ... **P10**:294
  Light curve of ... **P10**:159
  Observations of, *G. L. Jones* ... **P9**:408

Volume and Page
Cepheus, Stars of the 5th type in A1:235
Ceres, Pallas and *Vesta,* Diameters of, *E. E. Barnard,*
  (See Asteroids,) (1), (2), (4) A3:341
Chapel address, Jan. 8, 1902, *J. K. Rees* P10:135
Chromosphere in 1891 and 1892, Solar, *W. Sidgreaves* A2:539
  line in Angström 6676.9, *A. L. Cortie* A1:135
  C. A. Young A1:162
Chronograph, An improvised, *S. H. Brackett* A1:252
  A printing, *G. W. Hough* S5:161
Chronological notes, *R. W. McFarland* P3:441; P4:63, 194, 233, 353, 391, 529
  C. A. Young P4:451
Cincinnati observatory's new 16-inch, *J. G. Porter* P12:437
Circle on the celestial sphere, A great, *O. E. Harmon* P4:555
  Graduation of Harvard meridian, *W. A. Rogers* S3:306
Circles, Notes on meridian, *J. Tatlock, Jr* S3:275
  Right ascension, *H. M. Parkhurst* S4: 23
  at Strassburg, Meridian, *E. S. Holden* S3:199
Circumpolar stars, A chart, *H. C. Russell* P4: 61
Clark, Autobiography of Alvan S8:109
Clark & Sons, Corporation, The Alvan, *W. W. Payne* P15:413
Climate as related to astronomical observations, *W. H. Pickering* P3:464
Clock connections for operating chronograph, Electrical A3:184
  corrections, Computations of, *F. H. Bigelow* S7: 97
  for Lick observatory, *E. S. Holden* S1:135
  rate and barometric pressure, Relation between P7:501
  stopped by lightning P12:570
Clocks, Break-circuit for, *C. H. Chandler* S9:233
  W. P. Gerrish S9:124
  Non-interfering break-circuit for, *F. G. Blinn* S10:475
Cloud heights and velocities, *Nature* P4:141
Clusters and nebulae, Catalogue of P16:264
Code for aurora observations A3:170
  Gerrish system, *E. C. Pickering* P14:252
Coffin's tables, Errors in, *W. C. Winlock* S2:219
Color curve of a lens, Obtaining, *H. Crew* A1:933
  perception, *F. J. B. Cordeiro* P16:609
  phenomena at sunset, *G. C. Comstock* A2:769
  J. E. Keeler P7: 98
  L. Swift P6:589
Come learn of the stars, *T. B. Smith* S7:213
Comet:
  Biela A2:278
  Brooks Periodic, (See 1889 V, 1896 VI)
    S8:321, 363, 371, 417; S9:39, 125, 134; P1:89; P2:424; P4:50, 105, 160, 219, 270, 272, 387; P11:44, 266, 348, 395, 451, 506, 567.
    Companions to, *E. E. Barnard* S8:360

Volume and Page

Comet *(Continued)*
  Brooks, *W. R. Brooks*......**S8**:363
    and Comet Holmes, Spectra of, *W. W. Campbell*......**A2**: 57
      Lexell, Identity of, *C. L. Poor*......**P13**:178
    in Jupiter's satellite system, *J. A. Parkhurst*......**A2**:856
    Orbits of, *H. C. Wilson*......**A2**:793; **P1**:151
    Return of 1903-4......**P11**:348, 395, 451, 506, 567
  Brorsen, Short period of, *G. A. Hill*......**A1**: 7
    S3:218, 283; **S8**:464; **S9**:37-8; **A1**:251, 343; **A3**:787; **P8**:558.
  D'Arrest.....**S2**:145; **S9**:38, 227, 420, 465; **P4**:572; **P5**:50, 108, 166, 275; **P11**:450.
  Donati......**A2**:572; **P16**:646
  Encke, Periodic, **S5**:19; **S7**:353; **S10**:367, 420; **A3**:869; **P2**:189, 234-5, 279-80, 333; **P6**:250, 304; **P9**:405, 513; **P12**:136, 489, 562, 673; **P13**:53.
      (See 1888 II)
  Finlay through Praesepe cluster (See 1886 VII)......**A2**:759
  Halley **A3**:325
    J. C. Dean......**P16**:331
    Detroit News......**P16**:522
    F. W. Henkel......**P15**:238
    E. F. McPike......**P12**:685
    Research committee on......**P16**:574
    Ephemerides of, *O. C. Wendell*......**P16**:71, 459, 509
    Perturbations of **P15**:317
  Holmes, (See 1892 III, 1899 II.)
    A1:929, 940; **A2**:83-4, 176, 180-4, 277, 369-70, 854, 934; **A3**:324; **P3**:39; **P7**:273, 327, 387, 498-9, 541; **P8**:101; **P14**:114, 495.
      Disintegration of, *W. W. Payne*......**A2**: 18
      New outburst of......**A2**:179
        E. O. Lovett......**A2**:277
      Physical appearance of, *H. C. Wilson*......**A2**: 31
      Probable origin of, *S. J. Corrigan*......**A2**:24, 99
        E. Holmes **A2**:370
      Spectrum of, *J. E. Keeler*......**A2**:272
      Transformation of, *E. E. Barnard*......**A2**:180
  Lexell, *E. E. Barnard*......**S9**:116
    and Comet Brooks, Identity of, *C. L. Poor*......**P13**:178
  Newton, *J. B. Wood*......**P1**:411
  Schmidt, 1882, Elements of......**S1**:259
  Swift observed and photographed, *E. E. Barnard*......**A1**:386
  Tempel$_1$-Swift (1867 II) **S10**:147, 287, 367, 419, 468, 476; **A1**:85, 250, 343, 626; **P6**:252, 306; **P13**:271-3.
  Tempel$_2$-Swift (1873 II) **S8**:133; **A3**:411, 514, 598, 706; **P1**:422, 472; **P7**:271, 291, 327, 386, 439; **P8**:102, **P12**:487, 671; **P13**:53, 97.
    C. D. Perrine......**P7**:291

Volume and Page

Comet, *(Continued)*
- Tempel$_2$-Swift **P4**:572; **P10**:438; **P11**:46; **P16**:508, 575, 644
- Winnecke, (See 1886 VI, Comet 1892, 1898 II.) **S5**:288; **S10**:516; **A1**:86, 170, 342, 444, 536, 626, 747, 837; **A2**: 184; **P4**:220; **P5**:440, 557; **P6**:57, 251; **P11**:566; **P12**:137.
- Wolf, (See 1884, III, 1891, 1898 IV.) **S3**:254, 283, 286, 318; **S4**:27; **S5**:18; **S9**:184; **S10**:201, 241, 287, 366, 420, 469, 476, 516; **A1**:86, 169, 170; **P6**:250, 305, 358, 415, 476, 534, 584; **P7**:45, 165; **P12**:360.
- Zona (1890 IV) and Spitaler (1890 VII), Strange coincidence, *E. E. Barnard* **S10**: 18
- 69 B. C. **P16**:646
- 1812 I and 1846 IV, *D. Kirkwood* **S5**: 13
- 1825 I **P16**:452
- 1827 I **P11**: 46
- 1844 I and 1886 V, *H. C. Wilson* **S6**:121
- 1845 II **P10**:153
- 1846 VI, *H. P. Tuttle* **P6**:561
- 1851 III (See Comet Brorsen.)
- 1858 I Tuttle **S1**:310; **S5**: 59
  - III Tuttle, *L. Swift,* **S3**:154, 181; *H. P. Tuttle* **P6**: 6
- 1862 II, *G. W. Hough* **P6**:585
  - III, *H. P. Tuttle* **P6**:535
    - Discovered by whom, *W. F. Denning* . . . . . . **P7**:15, Cor. **P7**:105
    - *L. Swift* **P6**:417, 562; **P7**:104
- 1863 I **P11**: 44
- 1866 and November meteors, *D. Kirkwood* **S4**:225
- 1874 II **S1**:309
- 1879 V **P3**:328
- 1881 (*b*) **S2**:305
  - II Tebbutt **P11**: 44
  - V Denning **S9**:38, 87; **P11**:395
  - VI Barnard **S6**:320
- 1882 I (*a* 1882) Wells **S1**:60, 127; **S2**:128, 163
    - Notes, *H. C. Wilson* **S3**:137
    - Photometric observations of **S1**:272
    - Spectrum of, *Lohse and Copeland* **S1**:134
    - *W. M. Huggins* **S1**:114
  - II Gould (Great Cruls, *b* 1882) Notes, **S1**:165, 167, 171, 187-90, 195-6, 200, 221, 224, 227-30, 233, 236, 254-5, 278; **S2**:27, 29, 128, 162; **S7**:309; **S8**:229; **S9**:226.
    - *C. S. Hastings* **S1**:171
    - *H. A. Howe* **S3**: 97
    - Nucleus of, *H. C. Wilson* **S3**: 1
    - Tail of, *E. E. Barnard* **S3**:168
  - III (*c* 1882) Barnard, Observations of **S1**:168, 236

Volume
and Page

Comet, *(Continued)*
1883 I Brooks........................**S2**:56, 63, 95; **S3**:55; **S5**:92; **P14**:430
W. H. Numsen........................**S3**:81, 110; **S5**: 92
Changes in, *W. T. Sampson*........................**S3**: 44
transits over star................................**S3**:118
IV = Pons 1812 (Brooks) **S2**:220, 257, 285, 288, 318-9; **S3**: 26-9, 44, 54, 59, 62, 81, 90, 118, 137; **S4**:152.
1884 I Ross....................................**S3**:55, 124; **P6**:357
II (*b* 1884) Barnard **S3**:188, 190, 252, 284, 313, 316-7; **S4**:29; **S5**:21; **S9**:37, 87; **P2**:189, 382; **P3**:38; **P8**:461.
H. C. Wilson....................................**P2**:321
Probable observation of, *L. Swift*....................**P3**: 17
III (*c* 1884) Wolf (See Comet Wolf.)
1885 II (*a* 1885) Barnard **S4**:179, 184, 186, 217, 219, 222, 252-3; **S5**:19, 93, 127, 153, 157; **S9**:184.
1886 I (*d* 1885) Fabry................**S5**:62, 122, 142, 153, 157-8, 189, 256
II (*e* 1885) Barnard....................**S5**:21, 57, 118, 122, 142, 256
III (*b* 1886) Brooks **S4**:252; **S5**:19, 185, 187, 220, 317; **P3**:482; **P16**:452.
IV (*c* 1886) Brooks.... **S5**:217-8; **S10**:517; **A1**:85, 169, 251, 343, 537
V (*a* 1886) Brooks..........................**S5**:89, 91, 185-6, 190
VI (*d* 1886) (See Comet Winnecke.)
VII (*e* 1886) Finlay **S5**:309; **S6**:42, 221; **S9**:135; **A2**:372, 469, 569, 663, 759.
VIII (*c* 1887) Barnard................................**S6**:114
IX (*f* 1886) Barnard..........................**S5**:275, 310; **S7**:118
1887 I (*a* 1887) Thome..........................**S6**:113, 226; **S7**:248
II (*b* 1887) Brooks..............................**S6**:113; **P12**:487
III (*d* 1887) Barnard.............................**S6**:161, 221, 320
IV (*e* 1887) Barnard..........................**S6**:220; **S7**:125, 405
V (*f* 1887) Olbers-Brooks..........**S3**:283; **S6**:289, 294, 327; **S7**: 89
1888 I (*a* 1888) Sawerthal **S7**:118, 168, 170, 215, 216, 221, 257, 262, 268, 308, 352.
II (*b* 1888) Encke (See Comet Encke).........**S7**:353; **S10**:367, 420
III (*c* 1888) Brooks....................**S7**:353, 364-5, 404; **S9**: 87
IV (*d* 1888) Faye **S7**:354; **S8**:34; **P3**:152, 209, 327; **P11**:266, 348, 451, 566.
V (*f* 1888) Barnard..........................**S7**:459; **S8**:34, 84
1889 *a* Brooks (Seen but once)................................**S8**: 84
I (*e* 1888) Barnard **S7**:354, 357, 405, 446, 451, 456; **S8**:34, 39, 132, 225, 319, 370; **S9**:135, 185, 227, 275-7.
II (*b* 1889) Barnard.......**S8**:227, 266, 319, 370, 418, 466; **S9**:88, 420
III (*c* 1889) Barnard................................**S8**:320, 371
IV (*e* 1889) Davidson................**S8**:322, 372; **S9**:228; **P12**:487
V (*d* 1889) (See Comet Brooks)
VI (*f* 1889) Swift......................**S8**:463, 465; **S9**:26, 40, 88

Volume and Page

Comet, *(Continued)*

1890 I (*g* 1889) Borrelly........**S9**:40, 88-9, 275

II (*a* 1890) Brooks....**S9**:229, 276, 323-4, 373, 420, 465; **S10**:147, 201

III (*b* 1890) Coggia........**S9**:37, 185; **A2**:371

IV (*e* 1890) Zona........**S9**:466; **S10**:18, 35, 101-2; **P4**:105

VI (*c* 1890) Denning........**S9**:374, 419

VII (*f* 1890) Spitaler........**S9**:466; **S10**:18, 35, 101

1891 I (*a* 1891) Barnard-Denning........**S10**:241, 288, 368; **P10**: 99

IV (*e* 1891) Barnard........**S10**:469; **A1**:87, 251

1892 I (*a* 1892) Swift **A1**:342, 344, 443-4, 523, 536, 625, 698, 747, 836, 942; **A2**:184.

A. E. Douglass........**A2**:202

Photography of........**A2**:645

II (*c* 1892) Denning........**A1**:343, 445; **A2**:184; **P6**: 56

III (*f* 1892) (See Comet Holmes.)

IV (*b* 1892) Spitaler (See Comet Winnecke.)

V (*e* 1892) Barnard........**A1**:835, 941; **P7**:387; **P8**:215; **P14**:113

Photographic discovery of, *E. E. Barnard*........**P3**: 13

VI (*d* 1892) Brooks...**A1**:343, 697, 746, 833-6, 941; **A2**:85-6, 569, 663

1893 I (*g* 1892) Brooks........**A1**:697, 941; **A2**:85, 185, 279, 369, 470, 569

(*c* 1893) Brooks........**A2**:854, 936; **A3**:80, 255; **P1**:143, 186-7

E. E. Barnard........**P1**:145

Photographs of, *E. E. Barnard*........**A3**:789

Spectrum of, *W. W. Campbell*........**A3**:571

II (*b* 1893) Rordame-Quenisset **A2**:596, 658, 660, 751, 757-8, 854, 934; **A3**:170.

W. W. Campbell........**A2**:652

G. E. Hale........**A2**:653

J. E. Keeler........**A2**:650, 751

W. W. Payne........**A2**:596

Photographs of........**A2**:660; **P1**:44, 143

Photography of, *W. J. Hussey*........**P2**:353, 445

Spectrum of, *W. W. Campbell*........**A2**:652; **A3**:571

1894 I (*a* 1894) Denning........**A3**:323, 410, 514-5; **P1**:421, 469; **P9**:348; **P12**:58; **P16**:575

II (*b* 1894) Gale... **A3**:411, 504, 512-4; **P1**:422, 470-2; **P2**:44; **P9**:348

in a 1½-inch glass, *F. E. Harpham*........**P1**:472

Photographs of, *E. E. Barnard*...**A3**:421, Cor. **A3**:706

IV (*e* 1894)......**P2**:189, 234, 279; **P3**:871; **P8**:47, 396, 557; **P15**:433

Ephemeris, *F. H. Seares*........**P14**:113

and lost comet De Vico, 1884 I, *H. C. Wilson*........**P2**:241

1895 II (*a* 1895) Swift........**P3**:95, 151, 264-5; **P7**:44; **P10**:266, 380, 493

III (*d* 1895) Brooks........**P3**:209, 211, 266, 270, 327

IV (*c* 1895) Perrine.....**P3**:209, 245, 265, 279, 327, 434-6, 533; **P4**:161

C. D. Perrine........**P3**:245, 279

1896 III (*b* 1896) Swift........**P4**:50, 105; **P7**:221

Volume
and Page

Comet, *(Continued)*
1896 IV (*e* 1896) Sperra (See Comet Brooks.)
V (*d* 1896) Giacobini.......**P4**:218-9, 271, 333, 386; **P11**:206, 395, 452
VII (*a* 1896) (*g* 1896) Perrine-Lamp.......................
.......................**P3**:434; **P4**:385, 449-50, 525; **P11**:153
1897 I (*f* 1896) Perrine..........................**P4**:332, 334, 386; **P5**:49
III (*b* 1897) Perrine...............................**P5**:390-1, 438
1898 I (*b* 1898) Perrine.......**P6**119-20, 181, 248-50, 355, 414, 475; **P7**:220
II (*a* 1898) Perrine (See Comet Winnecke...**P5**:440, 557; **P6**:57, 251
III (*d* 1898) (See Comet Encke.)
IV (*f* 1898) Hussey (See Comet Wolf.)
V (*g* 1898) Giacobini..........................**P6**:357, 415; **P10**:211
VI (*e* 1898) Perrine..................................**P6**:306, 356-7
VII (*c* 1898) Coddington-Pauly **P6**:305, 356, 358; **P7**:220, 388; **P9**:213
VIII (*j* 1898) Chase................**P6**:583; **P7**:44, 97, 166, 271, 328
IX (*h* 1898) Perrine..................................**P6**:474-5, 513
X (*i* 1898) Brooks.........................**P6**:533-4, 556; **P12**:351
Orbit of, *W. J. Hussey*.....................**P6**:556
1899 I (*a* 1899) Swift **P7**:218, 274, 326
II (*d* 1899) Holmes, Rediscovery of, *C. D. Perrine*............**P7**:340
(See Comet Holmes.)
III (*b* 1899) Tuttle................................**P7**:219, 272, 327
V (*e* 1899) Giacobini.............................**P7**:439, 497-8, 541
1900 I (*a* 1900) Giacobini.......................**P8**:159, 161, 216, 288, 344
II (*b* 1900) Borrelly-Brooks **P8**:396, 400, 403, 461, 463, 558;
P9:159; **P11**:565.
III (*c* 1900) Giacobini...................................**P9**:106, 159
1901 I (*a* 1901) Great..........................**P9**:348,404, 513; **P10**:154
E. A. Fath....................................**P9**:289
(*b* 1901)—(See Comet Encke)
Hall's comet **P9**:352
1902 (*a* 1902) Brooks.......................................**P10**:324
III (*b* 1902) Perrine...................................
.......**P10**:437-8, 444, 491-2, 542; **P11**:94, 151, 152, 154, 206
W. W. Payne..**P10**:477
(*c* 1902) Grigg....................................**P10**:438, 492
1903 I (*a* 1903) Giacobini....................**P11**:93, 151-2, 205, 267, 347
II (*d* 1903) Giacobini................**P11**:43, 94-5, 109, 151, 154, 266
III (*b* 1903) Grigg..........................**P11**:345, 347; **P13**:336
IV (*c* 1903) Borrelly...................**P11**:390-4, 450, 519; **P12**:281
Photographic observations of...........**P11**:394
1904 I (*a* 1904) Brooks.......**P12**:349, 351, 413, 415, 490, 672; **P13**:98, 337
II (*d* 1904) Giacobini............................**P13**:99, 164-5, 338
1905 II (*e* 1904) Borrelly.............................**P13**:100, 166
III (*a* 1905) Giacobini...........................**P13**:269-71, 404
IV (*b* 1906) Kopff....................**P14**:242, 301-2, 373; **P15**:307
V (*b* 1905) Schaer.............................**P13**:566; **P14**:53-5

	Volume and Page
Comet, *(Continued)*	
1905 ¬ (*d* 1905) Slipher	**P14:** 57
VI (*a* 1906) Brooks	**P14:**170-2, 191
1906 I (*c* 1905) Giacobini	**P14:**56, 113, 173, 243, 301
Rotation of, *W. H. Pickering*	**P15:**100
II (*c* 1906) Ross	**P14:**243, 302-3
III (*f* 1906) Hough, (See Comet Holmes)	
IV (*e* 1906) Kopff	**P14:**494, 565-7, 628
V (*d* 1906) Finlay	**P14:**430, 564; **P15:**112
VI (*h* 1906) Metcalf	**P14:**630; **P15:**50-1, 126
VII (*g* 1906) Thiele	**P14:**628-9; **P15:**49-50, 111-113
1907 I (*a* 1907) Giacobini	**P15:**247-8, 307, 372, 631
(*b*) Mellish	**P15:**307, 373, 431, 569
(*c*) Giacobini	**P15:**431
(*d*) Daniel	**P15:**431-3, 504, 558, 569, 632; **P16:**246, 321, 380
E. E. Barnard	**P16:**591
Spectrum of, *Knowledge*	**P15:**558
O. C. Wendell	**P15:**622
(*e*) Mellish	**P15:**569, 632-3
1908 (*c*) Morehouse	**P16:**505, 507-9, 578-9, 644-5, 653
Photographic observations of, *J. H. Metcalf*	**P16:**655
J. A. Miller	**P16:**653
H. C. Wilson	**P16:**563
An unrecorded	**S1:**232
in corona of April 16, 1893, *J. M. Schaeberle*	**A3:**515
Computing relative brightness of a	**A1:**943
envelopes, *E. W. Preble*	**S1:**280
orbit, Graphical representation, *G. C. Comstock*	**P6:**465
return? When will the, *Knowledge*	**S1:**224
seeking, *W. R. Brooks*	**P7:**157
Science Observer	**S1:** 70
strike the earth? Might a, *F. Campbell*	**P8:**253
Comets of 1881	**S1:**10, 14
1882, *W. W. Payne*	**S2:**119
1886, *Astronomische Gesellschaft*	**S6:**201
W. C. Winlock	**S6:**112
1887 *H. C. Wilson*	**S7:**153
1887-8 *O. C. Wendell*	**S9:** 38
1889	**S9:**184
1892 *H. C. Wilson*	**A2:**121
1894	**P2:**384
1906 *H. Kreutz*	**P15:**421
Additional points relating to, *G. W. Coakley*	**A1:**652
to asteroid zone, Relation of short period, *D. Kirkwood*	**S7:**177
captured by planets, *H. A. Newton*	**A1:** 12
Chief discoverers of, *W. F. Denning*	**S9:**235

Volume and Page

Comets, *(Continued)*
  Chief discoverers of, *L. Swift* **S9**:122, 189
  Composition, purpose, and effect upon the earth of, *L. Boss* **S1**: 1
  designated **S3**:201; **S4**:5; **S5**: 50
  Determination of positions of, *M. W. Whitney* **P4**:177
  Dissipation of, *W. H. S. Monck* **S7**:239
  Galle's catalogue of **S4**:264; **S5**:5, 41
  Geometrical considerations applied to velocity of, *J. B. Wood* **P15**:553
  Meteoric theory of, *W. H. S. Monck* **S9**:216
  Models representing orbits of, *W. Harkness* **S6**:329
  Motion of, when far from the sun, *G. C. Comstock* **P10**:169
  Naked eye, *W. F. Denning* **P15**:411
  Optical appearances of, *S. V. Clevenger* **S6**: 89
  Origin of, *D. Kirkwood* **S6**: 77
  Our knowledge of, *H. C. Wilson* **S5**:257
  repelled by the sun? Are the, *G. W. Coakley* **A1**: 97
  to return in 1890, Periodic **S9**: 37
  Short period **S1**:9, 71
  Spectra of, *H. Kayser* **A3**:204
  Tails of, *E. E. Barnard* **P12**: 1
    A. J. Pigeon **S7**:457
    C. A. Ranyard **S2**:81; **S3**:184
  Tidal theory of, *G. W. Coakley* **A1**:177
  Tides of, *R. S. Tozer* **P13**:489
  Velocity of, *J. B. Wood* **P13**:140
  and meteors, *W. F. Denning* **P10**: 69
    W. H. S. Monck **A1**:171, 274
    and their families, *W. W. Payne* **P6**:1, 70, 143, 228
Comet-meteor radiants, *O. C. Wendell* **S4**:153; **S5**:152; **S6**:359
Comet-seeker, New form of, *G. A. Hill* **S7**:241
Cometary computation, *S. C. Chandler* **P6**:459
Cometic orbits, Statistics of **S3**:183
Common's 60-inch telescope, *E. C. Pickering* **P12**:660
Computing, The art of, *R. Buchanan* **P15**:287
  $\phi - \phi'$ and ρ, *F. Rust* **P15**:484
Conference, International meridian **S4**: 14
Conservation of energy, Results from principle of, *P. E. B. Jourdain* **P13**: 36
Constant *k*, Significance of **P2**:281
Constants determined by the U. S. C. & G. Survey, *E. D. Preston* **P6**:101
  of precession, nutation and aberration, Change of **P5**:274
Constellation study, *W. Upton* **P1**:1, 50, 115, 257, 308, 363, 391, 449
Constellations **S4**:150
  Methods of tracing, *W. A. Rogers* **S8**:145
Construction of the heavens, *H. Macpherson, Jr* **P14**:385
Co-ordinates, Summation of, *H. M. Parkhurst* **S5**: 53
Corona, Solar, *I. E. Christian* **P7**: 28

	Volume and Page
Corona, Solar, *(Continued)*	
W. Huggins	S4:136, 167
W. W. Payne	S2:152; S8:418, 425; S9: 93
Actinic brightness of the, *E. S. Holden*	S9:215
on April 16, 1893, *J. M. Schaeberle*	A2:693, 730; A3:307
Colors in the, *J. Ennis*	S6:273
Extent of the, *E. S. Holden*	S8:267
Objections to theory of the, *C. S. Hastings*	S2:307
Origin of disturbed region of, *C. D. Perrine*	P10:398
photographed in daylight, *D. E. Packer*	P3:361
Photographing the, *W. B. Featherstone*	P8:250
W. Huggins	S1:282; S4:283
W. W. Payne	P7:516
Burckhalter's apparatus for	P8:493
Probable nature of the, *C. G. Abbott*	P16:519
South polar rays of the, *J. A. Brashear*	S8:192, 224
Spectrum of the	P15:500
seen after totality, *A. C. De P. P. Maury*	P8:401
without an eclipse, Observing, *G. E. Hale*	A2:751
E. Miller	P8: 80
M. I. Puppin	A2:362
(note)	P8:106
Photographing, *G. E. Hale*	A2:260, 364; A3:662
γ *Coronae Australis,* Elements of, *H. C. Wilson*	S5:251
U *Coronae Australis,* (5484) *P. S. Yendell*	P3:150
Cosmic masses overweigh the stars, Transparent, *A. von Brandis*	P14:162
physiology, Historic notes on, *T. S. Hunt*	S1: 50
Cosmogony, The new, *J. E. Gore*	P14:515
Crater Linné, Observation of, *J. H. Stebbins*	P14:510
Crimson stars, Two, *R. O'Halloran*	P6:254
Crossley reflector, Photographic efficiency of, *W. W. Payne*	P8: 4
Cubic equation with three real roots, *C. Gilpin, Jr.*	P14:641
Cygnus, Nova, *E. C. Pickering*	S9:232
δ *Cygnus,* Origin of	S9:428
λ *Cygnus,* O Σ 413, Orbit of, *S. W. Burnham*	P4:397
61 *Cygnus, N. M. Mann*	S2:18; S10: 13
61 *Cygnus,* Parallax of	S4:284; S8:277
61 *Cygnus,* Proper motion of components of, *S. W. Burnham*	S10: 1
note	A3: 85
61 and 61^2 *Cygnus,* Parallaxes and connection of, *H. S. Davis*	P6:487
P *Cygnus,* Spectrum of, *J. E. Keeler*	A2:361
SS *Cygnus,* Variable star, *J. A. Parkhurst*	P6:156; P7:138
TX *Cygnus,* Period of	P10:215
UY *Cygnus*	P11:333
U^3 Cygnus, *R. O'Halloran*	P9:518
(See Variable stars)	

Volume and Page

- Dark-room, Ideal, *British Journal of Photography*......**P11**: 16
- Day of week on which date falls, To find, *A. Rydzewski*......**P7**:416
- Deviation of falling body from the vertical, *H. C. Wilson*......**P5**:186
- Dial of Ahaz, (See Sun-dials of Ahaz.)
- Diazenital, Communication about, *Fr. Nusl and J. Fric*......**P13**: 16
- Differentials of area and volume, *A. Hall*......**P10**: 5
  - New proof for, *J. Fricklin*......**S2**:209
- Diffraction, *H. M. Parkhurst*......**S5**:200
  - grating replicas, *T. Thorp*......**P14**: 93
  - gratings, *A. Cornu*......**A3**:207
    - (See Rowland's Gratings)
- Domes, Rotation of, *G. W. Hough*......**S2**:133
- Doppler's principle applied to motion of binaries, *T. J. J. See*......**A2**:812
- Double motion mechanism, New forms of, *F. L. O. Wadsworth*......**A3**:527
- Double star, Lost, *S. W. Burnham*......**P11**:250
    - *E. Doolittle*......**P13**:398
  - measures, *S. W. Burnham*......**P13**: 15
    - Poulkowa, *S. W. Burnham*......**A3**:354
  - notes, *G. W. Hough*......**A1**:349
  - observations, *G. C. Comstock*......**S9**: 78
    - of Dembowski......**S1**: 67
    - *F. E. Seagrave*......**S2**:22, 274
    - at Cape of Good Hope, *S. W. Burnham*......**P13**:333
      - Flower observatory, *S. W. Burnham*......**P10**:129
    - Errors in, *H. C. Wilson*......**S5**:174, 211
  - observing, Hints on, *S. W. Burnham*......**S1**:25, 73
    - *O. Stone*......**S1**: 95
  - orbit, Finding by graphical method, *S. W. Burnham*......**P1**:243, 349
    - *H. N. Russell*......**P6**:149
    - *T. J. J. See*......**A2**:581, 865
    - Studying, *N. M. Mann*......**S3**: 93
  - systems, Evolution of, *T. J. J. See*......**A2**:289
  - work, Poulkowa, *A. Struve*......**S5**:193
    - Recent, *S. W. Burnham*......**P14**: 79
  - 95 *Ceti* (A.C. 2) *S. W. Burnham*......**A2**:681
  - 30 and 41 *Geminorum*, *H. Sadler*......**S5**:218
  - *β* 107, *S. W. Burnham*......**P7**:1; **P8**:528
  - *β* 182, *S. W. Burnham*......**P8**:530
  - *β* 962, *S. W. Burnham*......**S8**:356
  - BD + 24°2733, Proper motion of......**P10**:552
  - DM + 17°573......**A1**: 92
  - H 2904, *S. W. Burnham*......**S5**:56, 93
  - H 2948, Measures of, *S. W. Burnham*......**A1**:173
  - ***h*** 3823, and ***h*** 4321, *F. P. Leavenworth*......**S7**:172
  - **Σ** 186, *S. W. Burnham*......**S10**: 72
  - **Σ** 503, *M. W. Whitney*......**S10**:300

	Volume and Page
Double star, *(Continued)*	
Σ 1216, *S. W. Burnham*	**A1**:662; **P5**:450
Σ 1321, Proper motion of, *F. W. Backhouse*	**S10**:377
S. W. Burnham	**S10**:168
Σ 1603, Proper motion of, *S. W. Burnham*	**A1**:549
Σ 1864, Proper motion of, *S. W. Burnham*	**A1**:870
Σ 2145, *H. C. Wilson*	**A2**:112
Double stars, *R. G. Aitken*	**P13**: 65
Edinburgh Review	**P11**:299
catalogued at Lowell observatory, 500	**P6**:189
discovered at Washburn observatory, *S. W. Burnham*	**S9**:299
distances of, *W. H. S. Monck*	**S7**:290
Evolution of, *C. H. Darwin*	**A2**:413
Measures of 748, *S. W. Burnham*	**S3**: 67
Micrometrical measures of	**A2**:282
Proper motions of, *S. W. Burnham*	**A3**: 14
F. P. Leavenworth	**S8**: 77
Draper, Henry, N. Y. *Tribune*	**S1**:258
Dumb-Bell nebula stars, Proper motion of, *E. E. Barnard*	**A3**:445
Durchmusterung, Revision of the Cape	**P12**:686
— 2° to — 23°, Schoenfeld's	**S3**:154
south of — 23°, Stone's, *E. S. Holden*	**S1**: 46
Durer contributions to astronomy, Raphael and Albrecht, *E. S. Holden*	**S9**:121
Dust envelope, Vast, *S. P. Langley*	**S3**: 21
particles in the air	**S9**:234
Earth, Annual motion of the, *J. Haywood*	**S7**:286
Attraction and figure of the, *W. W. Payne*	**P8**:177; **P9**:7, 117
before earth-moon catastrophe, *G. D. Swezey*	**P15**:397
Clairaut's theory of the figure of, *A. Hall*	**P9**: 60
Evolution of, *S. Houghton*	**S1**:147
Mean density of, *J. H. Poynting*	**P3**:232
measured, How, *J. E. Gore*	**A2**: 26
Rigidity of the, *T. J. J. See*	**P16**:602
tremors, *H. A. Howe*	**S8**:448
Visible shadow of, *J. Haywood*	**S4**:243
Waters upon the, *E. J. Brookings*	**S8**:301
and luminiferous ether, Relative motion of, *A. A. Michelson and E. W. Morley*	**S6**:306
and moon, Comparison of features of	**P12**:627
Earth's annual motion, Visualizing, *E. A. Bowen*	**P1**:178
J. B. Pence	**P2**: 46
L. Swift	**P1**:240
atmosphere, Mass of	**A1**:930
attraction due to spheroidal form	**P14**:318
axis, Oscillation of	**S10**: 47
Position of, *O. E. Harmon*	**P2**:219

Volume and Page

Earth's, *(Continued)*
  consolidation, Age of, *T. J. J. See* P15:545
  motions, Concerning, *G. S. Hodgins* P8: 60
  rotation proved P12: 71
    Ptolemy's argument against, *H. Hancock* S9:293
  way, Apex of, *T. J. J. See* P1:373
Earthquake, Feb. 23, 1892, *W. H. Pickering* A1:470
  April 18, 1906, and Lick observatory, *W. W. Campbell* P14:379, 441
Earthquakes, New theory of, *T. J. J. See* P16:199
  Objections to new theory of, *G. M. Crowl* P16:394
Eclipse of Agathocles, *W. T. Lynn* P13:201
      S. Newcomb P13:199
  aid to chronology, *R. W. McFarland* P10:172
      Q. A. Wheat P10:19, 138, 207
  cycle, *W. H. S. Monck* P10:240, 276
  cyclones, *H. C. O. Annals* P9:204
  phenomenon, *J. F. Lanneau* P9: 67
  photography, *A. Taylor* A2:267
  of Thales, *W. T. Lynn* P9:577
      W. H. S. Monck P10:127
      J. N. Stockwell P9:376
Eclipses, *J. Morrison* P4:308, 502
  Ancient, *W. H. S. Monck* P11:131, 242
      E. Nevill P14:616; P15: 32
      and chronology, *R. W. McFarland* P7:510; P9:176
  computed by students, *H. A. Howe* S4:205
  explanation of researches on ancient, *W. W. Payne* P14: 86
  Graphic method for lunar, *K. Laves* P15:533
  Lunar:
    1888, Jan. 28 .... S7:35, 121, 361
    1889, Jan. 16, partial, *E. E. Barnard* S8:137
    1891, Nov. 15 .... A1:91, 92; S10:421, 467, 521
    1892, Nov. 4 .... A1:834
    1894, partial, March 21 .... A3:165
      partial, (Sept. 14) A3:594, 705; P2: 38
    1895, March 11, *L. A. Eddie* P2:449
      L. Swift P3:269
      notes P3:101-4
    1899, Dec. 16, Changes during, *W. H. Pickering* P8: 57
      Occultations during P8:107
      notes P7:330, 540
    1902, Oct. 16, Chamberlin observatory P10:549
        H. A. Howe P10:548
        C. J. Ling P10:553
        R. O'Halloran P10:551
        D. S. Swan P10:548

	Volume and Page
Eclipses, Lunar, *(Continued)*	
1902, Oct. 6, *L. Swift*	**P10**:503
W. W. Payne	**P10**:480
1906 Coming total	**P14**:3, 185
and occultations, *G. W. Coakley*	**S4**:207
Graphic construction of, *W. F. Rigge*	**P3**:183, 247, 310, 353, 414, 454; **P4**:67, 123, 184
in one year, Seven, *F. H. Burgess*	**S8**:40, 135
R. W. Prentiss	**S8**: 85
Mathematical theory of, *W. W. Payne*	**P12**:515
Scientific value of total, *C. E. Furness*	**P3**:109
Solar, *J. Morrison*	**P5**:29, 129, 368
1882, June 17	**S1**:128
1883, May 6	**S1**:152, 194; **S2**:24, 141, 179
1885, March 16	**S4**:90-4, 120, 123-6, 147, 181, 219
1886, Aug. 29	**S5**:54, 282, 313
1887, Aug. 19	**S6**:105, 262, 292; **S7**:1, 161, 222
1889, Jan 1	**S7**:123, 448, 454; **S8**:64, 88, 234; **S9**:92-4, 238; **S10**:253
J. A. Brashear	**S8**:120
C. Burckhalter	**S8**: 97
C. W. Irish	**S8**:166
W. W. Payne	**S8**: 64
W. H. Pickering	**S8**:337
W. Upton	**S8**:118
1891, June 6	**S10**:242
1892, Oct. 20, *H. A. Howe*	**A2**: 88
notes	**A1**:627, 838, 839
1893, April 16, *J. King*	**A1**:863
H. S. Pritchett	**A1**:454, 562
notes	**A1**:838-9; **A2**:373, 461, 645; **A3**:82, 162; **P3**:211.
1894, April 5	**A3**:250
eclipses	**A3**:70, 595
1896, Aug. 8-9, *A. Fowler*	**P4**: 28
notes	**P3**:270; **P4**:44, 221, 389
1897, July 29	**P5**:162, 268-9
1898, Jan. 22, *Nature*	**P5**:378
H. C. Wilson	**P5**:251
notes	**P5**:498, 561
observed at Ahmednagar	**P6**:121
Buxar	**P6**:123
Talni	**P6**:124
by U. S. expedition	**P6**:125
1899, June 7	**P7**:330
1900, May 28, *E. B. Frost*	**P8**: 86
C. P. Howard	**P8**:550; **P9**: 18

Volume
and Page

Eclipses, Solar, *(Continued)*
1900, May 28, *M. Moye* P8:368
W. W. Payne P8:370
W. H. Pickering P8:225, 289
H. C. Wilson P8:240, 297
notes, P8:103, 108, 144, 153, 220, 224, 291, 295, 346
350, 398, 400, 407, 462, 464.
1901, May 18 .... P9:276; P11:577
in Sumatra, *E. E. Barnard* P9:527
A. N. Skinner P10: 1
1905, Aug. 30, *G. Bigourdan* P14: 28
W. W. Campbell P12:456
M. Moye P13:523
D. Todd and *R. H. Baker* P13:240
notes P13:473, 491
Polarization observations P14:189
Burgos, *C. P. Howard* P13:542
V. Ventosa P14:151
Egypt, *E. F. Hussey* P14:129
Leander McCormick observatory, *O. Stone* P13:574
Vinaroz, *A. L. Cortie* P13:575
visible in the U. S., *W. F. Rigge* P13:134
1908, Jan. 3, in U. S., *W. F. Rigge* P15:610
June 28, *R. O'Halloran* P16:516
in U. S., *W. F. Rigge* P16:271
W. Upton P16:456
Eclipses 1882 and 1905 compared P14:125
teach us, What solar, *D. Todd* P9:305
Electric circuits to eye end of equatorial, *W. W. Dinwiddie* P10:300
controls for astronomical instruments, *F. L. O. Wadsworth* A3:265
of equatorials, *W. C. Gurley* A3:641
G. W. Hough A3:524
lighting, Experiments in, *H. A. Howe* A2:505
phenomena in solar system, *J. Haywood* S5: 81
Electrical discharge discussed by Prof. Schuster A1:739
discharges through poor vacua, *M. I. Puppin* A1:483
Electro-magnetic induction, *M. A. Veeder* A2:264
Elements, neon and metargon, *Journal of Chemistry* P6:345
Elkin, W. L., Astronomical work of, *S. C. Chandler* P3:392
Ellipse passing through five points, *R. J. Adcock* S9:223
H. H. Furness. Jr S9:200
C. E. Myers S9:268
Ellipses, Practical method of drawing, *W. H. Pickering* P16:147
Ellipsograph and protractor, *S. W. Burnham* .... P4:181; Cor. P4:336
Elliptic motion, *A. Hall* P13:287
Elongation of *Polaris*, Tables for, *L. G. Weld* S9:269

	Volume and Page
English mile, *J. M. Clark*	**S9**:155
Enlarging photographic lens, *S. W. Burnham*	**A1**:558
Envelope of sphere, Rotation upon, *S. J. Corrigan*	**S7**:369, 420; **S8**: 49
Envelopes, Phenomena of cooling, *F. H. Bigelow*	**S6**:170
Ephemerides, Astronomical, *J. Morrison*	**P2**:301
Ephemeris, Lunar, *J. Morrison*	**P3**:362, 467
of planet or comet, Computation of, *M. C. Traylor*	**P9**:311
Planetary, *J. Morrison*	**P4**: 32
Sidereal, *J. Morrison*	**P4**: 90
Solar, *J. Morrison*	**P2**:406; **P3**:25, 86
Equation of the spectrometer	**A1**:932
Equator, Constants for, *R. Buchanan*	**P16**:346
Equatorial axis on ball bearings, *F. L. O. Wadsworth*	**A3**:723
of Chamberlin observatory, *H. A. Howe*	**A3**:709, 826
like Lick's, *H. S. Pritchett*	**S5**: 65
telescope, Adjustment of, *H. A. Howe*	**P3**:131, 193
K. Laves	**P8**:424, 535; **P9**: 13
note	**A3**:171
6 *Eridani,* Motion of, *S. W. Burnham*	**A2**:587
0^2 *Eridani, A. Hall*	**S1**: 94
Eros (433) (1898 DQ), Witt's planet, *S. C. Chandler*	**P7**: 26
A. Hall	**P6**:567, 584
W. W. Payne	**P7**:20, 278; **P8**:445
E. C. Pickering	**P6**:530; **P7**: 66
G. Ravene	**P6**:558
Campaign of, *H. C. Wilson*	**P9**:214; **P12**:683
Double planet, *H. C. Wilson*	**P9**:277
Elements	**P6**:470, 531; **P7**:107, 502; **P8**:102; **P10**:326
Ephemerides	**P8**:41, 345, 350, 560; **P9**:358; **P10**:326; **P11**: 47
Measures of	**P8**:519; **P12**:286
Notes	**P6**:470, 531, 567; **P7**:107, 502
Observations of, *M. Loewy*	**P8**:488
Goodsell observatory	**P9**:108, 167
Lick observatory	**P8**:519
Notes	**P8**:345, 350, 521, 564; **P9**:50, 108, 167; **P10**:326
Tables for	**P8**:437
Opposition of, 1900, *E. C. Pickering*	**P8**:350
1903, *M. C. Traylor*	**P9**:496
1905, *E. C. Pickering*	**P11**:501
notes	**P8**:563; **P11**:47, 501
Orbit of	**P7**:502
Photographs of, at Arequipa, *E. C. Pickering*	**P13**:350
university, Minnesota	**P9**:168
measured	**P10**:388
Positions in 1893, 1894 and 1896, *E. C. Pickering*	**P8**:405

Volume and Page

Eros, *(Continued)*
  Rediscovery of P10:382
  Reduction of 295 photographs, *A. R. Hinks* P12:531, 589
    note P12:501
  Variability in light of, *E. C. Pickering* P9:290, 358
    notes P9:213; P10:277
  Visibility of, *E. C. Pickering* P10:546
  and solar parallax, *A. R. Hinks* P11:439
    notes P9:465; P12:683
Errors of a divided circle, *R. H. Tucker* P11:523
Ether, *F. H. Getman* P7: 86
  Concerning the constitution of, *L. d'Auria* P15:101
  proved, Existence of all-pervading, *G. P. Fitzgerald* S7:386
  and gravitation, *W. H. S. Monck* P1:409
Euler-Lambert equation for parabolic motion, *A. Hall* P8: 2
  O. C. Wendell S9:176
European trip, *J. A. Brashear* S7:392; S8: 7
Expeditions: Astronomical, Argentina P16:460
    Arizona A3:316
    Peru S10:105
    Southern hemisphere, *H. D. Curtis* P12:687
  Eclipse, 1889, Goodsell observatory S8:177
      Lick observatory S8:339; S9: 94
      U. S. Naval observatory S9: 97
      Washington university S8:122
    1893, English A2:271; A3: 82
    1896, to Japan P3:379
    1898, to India P5:225, 561; P7:449
      Lick observatory P6:231
    1900 .... P8:289, 291, 295, 296
    1901, Amherst party P9:276
      Crocker, *W. W. Campbell* P9:221
    1905, *M. Proctor* P12:468; P13:90, 225
      U. S. Naval observatory P13:527
  Polar, Zeigler P16:194
  Solar research, from Yerkes observatory P12:503
Eyepieces, Magnifying power of, *C. C. Hutchins* S8:326
Faculae, *G. E. Hale* A3:113
  and prominences, *J. Evershed, Jr* A2:628
Faith and the fourth dimension, *H. Jacoby* P16:298
  Criticism of, *W. H. Johnston* P16:615
February Sundays, Determining five, *F. Campbell* P11:167
  T. C. Running P11:218
Field-glass, How and why of the Porro prism, *W. R. Warner* P10:281
Figure of the sky, Observational determinations of apparent,
  W. C. Brenke P9:351

	Volume and Page
Films, Photographic	P16:656
on glass, Distortions of photographic, *S. Albrecht*	P15:463
Filter Yellow K, *C. E. K. Mees* and *S. H. Wratten*	P14:572
Fireball, *W. F. Denning*	P5:167
H. A. Howe	P9:107
L. L. Stingley	P9:426
Flower observatory, university of Pa., *C. L. Doolittle*	P5:122
A. W. Quimby	P5:112
Focal point of lens of long focus, *G. A. Hill*	P11:379
Foley's tables for computing precession, etc., *E. S. Holden*	S1: 63
Free escapement with independent balance, *D. Appel*	A1:872
Funds, Gould, Research, etc., See "Awards."	
Galaxy, Collection of Sirian stars, *W. H. S. Monck*	A2:381
Gases, Constitution and function of, *S. J. Corrigan*	P4:247
Gauss and Bessell, Sayings of, Translated by *B. Trier*	P13:231
Gegenschein, *E. E. Barnard*	S2:254
I. E. Christian	P9:146
Cause of, *J. R. Holt*	P2: 94
Explanation of, *W. H. Pickering*	P8: 1
Observations of, *A. E. Douglass*	P2:29; P5:178
Parallax of, *J. Evershed, Jr*	P7:289, 352
Principle of	P2: 87
and zodiacal light	P6:366
or zodiacal light, *E. E. Barnard*	P1:337; P7:169
Geminorum (12.1903) before its discovery, Nova, *E. C. Pickering*	P11:261, 339
Chart and catalogue for observing, *J. G. Hagen*	P11:341
Comparison stars for Nova, *J. A. Parkhurst*	P11:328
Discovery of	P11:340
Notes, *Z. Daniel*	P11: 96
L. G. Léon	P11:277
C. D. Perrine	P11:512
H. C. Wilson	P11:258
4 *Geminorum* occulted by Jupiter, *J. Tatlock, Jr*	S5:254
H. C. Wilson	S1:311
Geneva observatory	P9:162
Geometrical construction of absorption lines of solar spectrum, *G. Higgs*	A2:547
Georgetown observatory work	P5:221
Gibbs, Josiah Willard, *H. A. Bumstead*	P11:446
Glass for lenses, New	P12:425
optical purposes, *J. A. Brashear*	P6:104
telescope objectives, *J. A. Brashear*	P1:221, 241, 447
Goodsell observatory, Astronomical work at, *H. C. Wilson*	P11:179
expedition to Montana	P12:506
Graduation corrections for fundamental observations, *R. H. Tucker*	P14:321
errors, Ultimate measurement of, *R. H. Tucker*	P12:579

	Volume and Page
Grating, Rutherfurd's photography and diffraction	**S1**: 68
to study stellar spectra, Concave, *H. Crew*	**A2**:156
Gratings, New ruling engine for	**S1**: 61
for optical purposes, *H. A. Rowland*	**S1**:116
in theory and practice, *H. A. Rowland*	**A2**:129
Gravitation, *J. E. Ayer*	**P13**:170
F. J. B. Cordeiro	**P13**: 8
Attempt to replace Newton's law of, *K. Laves*	**P5**:513
constant, Value of, *C. V. Boys*	**P3**:128, 167; **P4**:77, 120
G. K. Burgess	**P10**:421
W. A. Rogers	**P3**:316
H. Seeliger	**P5**:474, 544; **P6**: 40
C. A. Young	**P3**:153, 382
with altitude, Variation of, *H. Crew*	**A3**:404
Gravity, Constant of	**S9**:141
Force of, *E. S. Holden*	**S9**: 44
meters, Differential	**A2**:366
Greenwich, World's meridian	**S3**:273
"Gregorian," Historic, *A. W. Quimby*	**P5**:482
Growth of worlds, *W. W. Payne*	**P6**:346, 401; **P7**:124
Gyroscope, *F. J. B. Cordeiro*	**P15**:81, 146
Habitability of other worlds, *H. A. Howe*	**S4**:294
Hagen's astrophotographic journey, Father, *W. F. Rigge*	**P15**:326
Halley, Dr. Edmond, Bibliography of, *E. F. McPike*	**P13**:579; **P14**:425
Remarks on, *E. F. McPike*	**P12**:453
Halley's comet in 1835, *P. Bronte* (See Comet Halley)	**P12**:571
Hansen's moon tables, Correction of	**P14**:505
Harvard observatory equipment	**P9**:111
Growth of, *E. C. Pickering*	**P8**: 89
Photographic flashes from, *H. R. Donaghe*	**P6**:481
Heat radiation of the stars, *G. E. Hale*	**P7**:503
Heavenly bodies, *D. Kirkwood*	**P1**:205
Heavens in winter, *A. K. Bartlett*	**P13**: 30
Heiss, Edward, *W. F. Rigge*	**P14**:332
Helium terrestrial? Is, *W. W. Payne*	**P3**: 16
Hencke, Dr. Karl Ludwig, *W. Foerster*	**S10**: 20
M 13 *Herculis, E. E. Barnard*	**P8**:486
52 *Herculis, S. W. Burnham*	**A1**:465
RX *Herculis,* Light curve of	**P10**:158
ξ *Herculis,* Motion in line of sight, *A. Belopolsky*	**A3**:130
Herschel, Caroline, *E. A. Dent*	**P11**:123
Hertha, minor planet, (See Asteroids) (135)	**S2**:314
Hindu astronomer, *W. E. Plummer*	**P7**:244
Hipparchus, Precision of	**P14**:638
Hole in the heavens, Herschels on the	**S2**:125

	Volume and Page
Huggins, Dr., Recent papers of, *C. A. Young*	**S8**:289
Hussey's measures of the O Σ double stars, *S. W. Burnham*	**P9**:553
10th catalogue of 100 new double stars, *S. W. Burnham*	**P13**:473
Hyades, Occultations in the	**S4**:286; **S5**:28, 224; **S6**:163
H. C. Wilson	**P12**:611
α Hydrae, Variable	**S2**:277
ε Hydrae, S. W. Burnham	**S8**:207
Hydrogen envelope of star DM + 30°3639, *W. W. Campbell*	**A2**:913
Secondary spectrum of, *G. E. Hale*	**A3**: 57
Hymn, *G. Huntington*	**S5**:268
Hyperion, Motion of	**S9**:236
Hyperspace, Philosophy of, *S. Newcomb*	**P6**:380
Ice age, Astronomical theory of	**P10**:168
So-called, *L. Swift*	**P10**: 88
Illinois university observatory, *G. W. Myers*	**P6**:319
Illusion and its cause, *R. M. McCreary*	**P7**: 11
Immensity and minuteness, *J. E. Gore*	**P10**:225
Index of refraction and dispersion, *B. Hasselberg*	**A2**:455
Inhabited? Are other worlds, *D. E. Wing*	**P11**:536
Instruments for transportation, Packing, *S. C. Snell*	**P8**: 88
Some new astronomical, *F. Schlesinger*	**P10**:427
Integral reduced by hyperbolic functions, *F. Rust*	**P15**:581
Interpolation, *R. T. A. Innes*	**P9**:389
Theory and practice of	**P8**:402
Intersecting rainbows, *C. W. Pritchett*	**S7**:219
J. G. Hagen	**S7**:266
Interstellar medium, Integrity of, *D. Wood*	**P1**:224
Intra-Mercurial planets, *S. J. Corrigan*	**P5**:89, 139
G. Davidson	**S3**:113
H. Harrison	**S3**:135
L. Swift	**S2**:122, 242
Distances of	**S8**:473
Observations of	**S6**:84, 117, 196
Probability of four, *S. J. Corrigan*	**P4**:414
Search at eclipse for, *C. D. Perrine*	**P10**:460
Invisibility of transparent objects, *R. W. Wood*	**P11**:202
Invisible, How to measure the, *H. M. Parkhurst*	**S9**:406, 442
Iris (See Asteroid 7) Variability of, *E. C. Pickering*	**P12**:258
Iron as a comparison spectrum, Spectrum of, *H. C. Vogel*	**A1**:151
Janssen's visit to Mont Blanc observatory, *W. W. Campbell*	**A2**:858
Jena glass for telescopes	**S8**:282
Jovian phenomena, *G. W. Hough*	**P11**:297
A. S. Williams	**P11**:361
Julian period, *R. W. McFarland*	**P14**: 98
Jupiter, *G. W. Hough*	**P2**:145; **P8**:381; **P10**:393
A. S. Williams	**P11**:188

Jupiter, *(Continued)*
- Determining longitude on ... P13:229, 573
- family of comets, *W. W. Payne* ... A2:800; P1:25, 62; P14:124, 221
- Great red spot on, *E. E. Barnard*. A1:93, 686; A3:736; P2:129; P16:523
  - *W. F. Denning* .. S5:62, 281; S9:140; P14:34; P15:606
  - *G. W. Hough* ... S4:289; S5:183; S6:325; S10:378
  - *A. S. Williams* ... P15:560
  - *C. A. Young* ... S4:119; S5:289
  - Notes on ... S3:216; A2:925; P16:391
- Hypothesis regarding surface markings of, *A. E. Douglass* ... P8:473
- in 1889, J. E. Keeler's observations of ... S9:107
  - 1896, Physical aspect of, *H. F. Griffiths* ... P4: 25
  - 1896-7 ... P6:421
- Markings of, *W. W. Payne* ... P14:608
  - *M. W. Whitney* ... A2: 22
- Mass of ... A3:786
  - *E. S. Holden* ... S1: 66
- Motion of great red spot on, *W. F. Denning* .. P9:488; P10:460; P15:398
- Motions of spots and markings, *E. E. Barnard* ... S10:413
- observations, *S. F. Whiting* ... P16:457
  - with naked eye ... P1:240
    - 16-inch equatorial, *H. C. Wilson* ... A1:189
- Occultation of, *E. S. Martin* ... A2:276
  - *W. H. Pickering* ... S9:148
- at opposition, *E. A. Bowen* ... P1:133
  - *G. W. Hough* ... P3:519
- Physical constitution of, *G. W. Hough* ... A3:89; P11: 63
- Present knowledge of surface of, *G. W. Hough* ... P13: 19
- Rotation of, *G. W. Hough* ... P7:62; P11:114
  - *P. Lowell* ... P11: 1
  - note on ... P7:332
- Spectrograms of, *V. M. Slipher* ... P11: 1
- Spots and markings of, *G. W. Hough* ... A1:193
- Visibility of satellites of ... P9:414
- and Saturn, Synodic period of, *R. Buchanan* ... P16: 65

Jupiter's dark spots in north tropical region, *W. F. Denning* ... P7: 14
- satellites, *E. E. Barnard* ... A3:438
  - *W. H. Pickering* ... A2:193, 390, 481; A3:728
  - in 1664, *Nation* ... P1:288
  - Disks of, *E. E. Barnard* ... A3:272
    - *A. E. Douglass* ... A3:517
    - *W. H. Pickering* ... A3:423
  - invisible, Four of ... P15:191
  - Shadow of ... A2:925
  - visible to naked eye, *T. J. J. See* ... P6:257
  - I ... S5:155; S8:424; S10:517; P10:551

Volume and Page

Jupiter's satellites, *(Continued)*
II **S5**:155; **S8**:424; **A3**:357
III **S2**:31, 130; **S3**:124; **S4**:158; **S5**:125, 155; **S9**:426, 474; **S10**:431, 515; **A1**:94; **A3**:357; **P9**:411; **P10**:447, 551; **P11**:460, 513; **P12**:682.
E. E. Barnard **A3**:821
A. E. Douglass **P5**:308
IV **S3**:155; **S4**:124, 155, 186; **S5**:155, 184; **S8**:424; **S9**:429; **A1**:93; **A3**:357; **P2**:333; **P11**:574, 575.
V **A1**:749, 840, 945; **A2**:573, 756, 788, 856; **A3**:556, 781; **P1**:76, 87; **P7**:502; **P8**:48; **P10**:447; **P11**:407; **P12**:425
E. E. Barnard **A1**:749; **A3**:556; **P1**: 76
G. W. Hough **A1**:945
VI **P13**:106; **P14**:640; **P15**:110; **P16**:130
VII **P13**:225, 413; **P14**:430, 640; **P16**:130
VIII **P16**:246, 388, 491
Orbit of, *R. T. Crawford* and *W. F. Meyer* **P16**:491
southern equatorial belt, *L. Swift* **S9**:474
Keeler, J. E., Director Lick observatory **P6**:186
Keeler's, J. E., remains removed to Allegheny, Pa **P14**:311
Kepler's attitude towards astrology, *F. A. Tondorf* **P12**:299
correspondence, *J. G. Hagen* **S6**:109, 133, 212
equation, Important method of solving, *F. R. Moulton* **P3**:136
Solution of, *A. A. Rambaut* **P14**:423
problem, *J. Tatlock, Jr* **S7**:453
Kinetic theory of gases, *L. d'Auria* **P15**:210, 357, 385; **P16**:241
Kirchhoff's law, Pringsheim on, *H. Crew* **A1**:581
Kirkwood, D., *W. W. Payne* **P1**:167
Kodaikanal solar physical observatory established **P14**:505
Lacaille, 8262, Proper motion of, *E. S. Holden* **S2**:256
Lacertae, Nova, *M. Fleming* **A1**: 27
Lalande 4219, *F. P. Leavenworth* **S6**: 80
16616, Proper motion of, *E. Frisby* **S4**:185
Lane, J. Homer, Historical sketch of, *T. J. J. See* **P14**:193
Lanes, Law of, *T. M. Blakslee* **P13**:111
Lantern, Projection distances in, *H. W. Griggs* **P15**:316
slides, Relief in **P16**:588
La Place, Historical eulogy on, *Baron Fourier* **P3**: 1
Latent image in photography, Nature of the **P14**:123
Latitude and azimuth, Simultaneous determination of, *J. S. Cortie* **S10**:189
at Greenwich, Latest **S9**:330
New York, Variation of, *J. K. Rees* **P8**:169
determination, *A. M. Lamb* **S5**:179
by zenith telescope, *T. H. Safford* **S9**: 45
by elongation, *O. J. Klotz* **P3**:199
Periodic and secular variations of **A1**:176

Volume and Page

Latitude, *(Continued)*
  Photo-chronograph applied to determination of A1:633
  variation, *E. Doolittle* P3:105
      C. L. Doolittle P7:390
      A. M. Lamb S4:129
      Observatory P11:381; P14:469
      W. W. Payne P12:662
      T. H. Safford S9:422
      notes S8:422; S9:422; A1:175
    at Cincinnati P16:452
    German work on, *H. Jacoby* A1:471
    Observations of commission of 1907 .... P16:453
    LaPlace on, *A. B. Hancock* P2:349
    Periodic law of P4: 27
  and azimuth, Determination of, *J. S. Cortie* S10:189
Law of attraction of stellar systems S9:423
Laws of falling bodies, *J. G. Hagen* S4: 15
Lens, How to make a, *G. S. Jones* S10: 68
Leonids, (See Meteors)
α Leonis, (Regulus) Occultation of, *C. B. Hill* P14:440
W *Leonis,* Occultation of, *J. F. Cole* P10:331
Level, Clark's new, *W. A. Rogers* S1:210
Levels, Defects of sensitive, *G. C. Comstock* S10:299
  Deflection of the, *J. G. Hagen* S3:75, 107
5 M *Librae,* New variable, *D. E. Packer* S9:381; S10:107
Lick observatory, Mills expedition from, *W. W. Payne* P15:522
      work, *E. S. Holden* P5:181
  telescope, *E. S. Holden* S7:296
      disturbed by winds A2:572-3
      (36-inch), Comparative power, *W. W. Campbell* P16:560
      (40-foot) for expedition, *J. M. Schaeberle* P1: 72
Life in other worlds, *D. T. MacDougal* P7:420
      E. C. Mason P6:520
Light fluctuations of variables, Relation of, *G. W. Myers* P6: 7
  Limit of solar and stellar, *W. Huggins* S9: 22
  Measures of velocity of, *S. Newcomb* S5:15, 68
  in space, Dispersion of, *Observatory* P16:521
  Speed of P2:138
  Velocity of, *H. M. Parkhurst* S9:476
Lights at same time, Northern and southern, *H. Arctowski* P9:207
Light-waves applied to metrology, *A. A. Michelson* A3: 92
Limits of vision, *G. Davidson* P10:111
      E. Holmes P9:499
Liquefaction of gases, *J. Dewar* P10:469, 531; P11:8, 79, 117
Liverpool address, by Edward C. Pickering S2:281
Locus of center of gravity, *T. J. J. See* A3:627

	Volume and Page
Logarithmic computations, *H. A. Howe*	**S2**: 45
Longitude, Determination of	**S2**:31; **S9**:420
N. R. Pogson	**S5**: 14
by moon culmination, *C. L. Doolittle*	**S4**:231
from sextant observations, *S. J. Corrigan*	**S6**:175
of observatory, university of Minnesota	**P15**:315
and latitude of new U. S. naval observatory, *J. R. Eastman*	**A2**:699
and photographic work, at Greenwich	**A2**:607
time, *P. Smith*	**S2**:175
Longitudes, Heliographic, *F. H. Bigelow*	**A2**:821
new origin for terrestrial	**S10**:269
Lowe observatory, *L. Swift*	**P3**:465
Lowell expedition to the Andes, *D. Todd*	**P15**:551
observatory in Mexico, *A. E. Douglass*	**P4**:489
work, *A. E. Douglass*	**P2**:395
W. W. Payne	**P4**:163; **P8**:448
Lunar apsides, Motion of, *E. Colbert*	**S6**:49, 82
atmosphere, *W. H. Pickering*	**P8**:205
and occultation of Jupiter, *W. H. Pickering*	**A1**:778
crack in Valley of Alps, *W. H. Pickering*	**P13**: 64
crater and rills, Hyginus, *E. S. Holden*	**S9**:119
cusps with horizon, *F. Elcharwich*	**P7**: 52
cycle, *R. W. McFarland*	**P14**: 27
eclipses as problems for students, *J. G. Hagen*	**S3**: 46
formations, Origin of, *W. H. Pickering*	**P8**:147, 181
observations by Dr. Klein, *W. H. Pickering*	**P10**:118
phenomena in October, *W. H. Pickering*	**P10**:419
photographs taken at Lick observatory, *R. Sprague*	**A1**:348
photography	**A2**:377
W. R. Brooks	**S7**: 37
Lyra, Central star of Ring nebula, *J. E. Keeler*	**A1**:824
Ring nebula in, *H. C. Wilson*	**P5**:337
Note	**S7**:42, 359
β Lyrae, Note on	**P10**:155
Light changes of, *G. W. Myers*	**P6**:268
Spectrum of, *A. Belopolski*	**A2**:258
H. C. Vogel	**A3**:358, 561
Visual observations of, *J. E. Keeler*	**A2**:350
U *Lyrae*	**P9**:518
W *Lyrae*, Period and light curve of	**P10**:215
R. O'Halloran	**P15**: 95
Lyrids, See Meteors.	
Macpherson, H. Jr	**P15**:177
Magellanic cloud, *E. C. Pickering*	**P5**:411
Magne-crystallic action and the aurora, *M. A. Veeder*	**P12**:182
Magnesium is a source of light	**A1**:525

Volume and Page

Magnetic disturbance, *G. M. Whipple*........**A1**:332
  disturbances, Solar origin of, *E. W. Maunder*........**P13**:59; **P14**:228
    T. S. H. Shearman........**P13**:226
    P. Tacchini........**A1**:436
  fields surrounding the sun, *F. H. Bigelow*........**A2**:706, Cor. **A2**:848
  influence, West Indian hurricane and, *F. H. Bigelow*........**A3**:441
    H. A. Hazen........**A3**:105, 443
  perturbations of the sun-spot........**A1**:330
    M. Moreaux........**A1**:318
Magnetic Storms—See Auroras.
Magnetic storm of February in Mauritius........**A1**:525
  storms, aurorae, and solar phenomena, *W. J. S. Lockyer*........**P11**:552
    M. A. Veeder........**A2**:449
Magnitudes of the stars, Photographic, *E. C. Pickering*........**P6**: 59
    and visual........**A1**:482
Mare Crisium, *W. W. Payne*........**P11**:130
Mars, *A. E. Douglass*........**P7**:113
  P. Lowell........**A3**:538, 645, 740, 814; **P2**:1, 52, 97, 154, 255, 343; **P4**:113
  (I Introductory, **P2**:1, II Polar snows, **P2**:52; III Spring phenomena, **P2**:97; IV Atmosphere, **P2**:154; V Canals, **P2**:225; VI Oases, **P2**:343; *P. Lowell.*)
  W. W. Payne........**P3**:345, 385; **P15**:449, 539
  W. H. Pickering........**A1**:668, 849; **P13**:305
  G. Schiaparelli........**A3**:635, 714
  as the abode of life, by *P. Lowell*........**P16**:129
  Atmosphere of, *W. W. Campbell*........**P3**:438
    P. Lowell........**P2**:154
  Axis of rotation........**P12**:428
  Calendar for, *D. A. Drew*........**P4**:417
  Canals of, *J. R. Holt*........**A3**:347
    P. Lowell........**P2**:255
    Observatory........**P16**:520
    W. W. Payne........**P12**:365
    are what?........**P15**:579
    Changes in the........**P12**:281
    Double, *P. Lowell*........**P5**:234
      W. H. Pickering........**P12**:385
    photographed, *P. Lowell*........**P13**:479
  Climate of, *M. Manson*........**P2**:371
  Colors exhibited by, *W. H. Pickering*........**A1**:449, 545, 632
  Drawings of, *W. L. Leonard*........**P15**:387
  get its moons? Where did, *E. Miller*........**P4**:424, 499
    note........**P4**:573
  Is aqueous vapor present on, *E. I. Yowell*........**P7**:237
  Meagre news from, *L. Swift*........**A1**:678
  Means of sharpening photographic image of, *P. Lowell*........**P15**:612

Volume and Page

Mars, *(Continued)*
Micrometric measures of the diameters of, *P. Lowell*.......P3:287
Oases of, *P. Lowell*.......P2:343
Observations of A3:785
at Goodsell observatory, *H. C. Wilson*.......A1:685
Halsted observatory, *C. A. Young*.......A1:675
Lick observatory, *E. E. Barnard*.......A1:680
E. S. Holden.......A1:663
Washburn observatory, *G. C. Comstock*.......A1:679
by Phillips in 1903.......P12:212
Occultation, 1892, by the moon, *G. E. Hale*.......A1:610, 627
G. W. Hough.......A1:945
H. A. Howe.......A1:745
J. E. Keeler.......A1:831
Opposition in 1892.......A1:541; P2:430
1905-7-9, *R. Buchanan*.......P13:137
Our knowledge of, *J. Ritchie, Jr*.......S9:450
Photographs of surface of, *W. H. Pickering*.......S9:254
Physical, *Dr. Terby*.......A1:478, 555
condition of.......S9:122
Polar caps of, *P. Lowell*.......P11:369
(north), *P. Lowell*.......P4:202; P15:416
(south), *A. E. Douglass*.......A3:738
Diameters of, *E. E. Barnard*.......P2:433
Melting of, *W. H. Pickering*.......A3:308
rifts and arctic canals on, *P. Lowell*.......P10:113
snows, *P. Lowell*.......P2: 52
and non-glaciation, *J. R. Holt*.......P2: 78
Position of the axis of.......P14:190
north pole, *G. S. Jones*.......P10: 54
Projections on terminator of, *A. E. Douglass*.......P11:24
Region of Lacus Solis on, *J. M. Schaeberle*.......A3:644; P2: 72
Satellite IX of, *E. C. Pickering*.......P12:568
Satellites of, *W. W. Payne*.......S1:23; S3: 73
Nautical almanac errors in orbits of.......A3:707
Pretended early discovery of, *R. Copeland*.......A1:553
Schiaparelli's latest views on, *W. H. Pickering*.......A3:632
Seas of, *J. R. Hooper*.......P4:300
W. H. Pickering.......A3:553
Spectrum of, *W. W. Campbell*.......A3:752
Spring phenomena, *P. Lowell*.......P2: 97
Study of P11:409
Supposed signals from, *P. Lowell*.......P10:185
Surface markings on, *G. H. Lepper*.......P13:130
note P10:277
Visual, *W. H. Pickering*.......S9:369

Volume and Page

Mars, *(Continued)*
  Why there are no mountains on, *T. J. J. See*……**P16**:255
  and his canals, *H. C. Wilson*……**S8**: 13
    Pyrois, *R. W. McFarland*……**P2**:238
    Saturn, *E. E. Barnard*……**S8**:428
      in conjunction, *L. G. Léon*……**P12**:147
"Mars," Lick review of, *A. E. Douglass*……**P4**:199
Martian canal development, *P. Lowell*……**P13**: 1
  snows, *W. H. Pickering*……**P13**:196
  and lunar canals, Studies in, *W. H. Pickering*……**P12**: 77
Martians? Are there possible, *G. S. Jones*……**P9**:234
Mass to energy, Relation of……**P16**:329
  of universe to stellar dynamics, Relation of, *L. d'Auria*……**P12**: 20
Master's degree, Requirements for……**P12**:387
Mathematical progress in America……**P13**:229
  symbols, Notes relating to, *H. S. Davis*……**P5**:402
  teaching, Movements in, *D. E. Smith*……**P13**:205
Mathematics needed for professional astronomy, *W. W. Payne*……**P15**:493, 600
      and astronomy, Culture value of, *W. W. Payne*……**P12**:585, 633
        physics, Teaching……**P16**:589
Mechanics, General problems of celestial, *H. Seeliger*……**P4**:407, 475, 545
Medal awarding address, *W. de W. Abney*……**A3**:283
Mean time into sidereal, New method of converting……**P10**:276, 388
Measuring faint spectra, Method of, *W. Harkness*……**S1**: 52
  photographic plates, New apparatus for……**A2**:512
Measurement of photographic intensities, *E. C. Pickering*……**P8**:328
Measurements of minute linear distances……**P14**:383
  Paris observatory bureau, *D. Klumpke*……**A2**:783
  Refinement of modern, *J. A. Brashear*……**S9**:204
Measures of star preceding *β Capricorni*……**S5**:285
  Sirius, Procyon and *β* 395……**P5**:558
Medals, Laland, Royal Astronomical Society, etc. (See Awards)
Mercury, *P. Lowell*……**P4**:360
    W. W. Payne……**P7**:466
    Elongations of, (1905)……**P13**:281
    Mass of, *Nature*……**A3**:781
      note……**P11**:461
      E. C. Pickering……**P10**:554
    Naked eye object, *W. F. Denning*……**P8**:202
    Physical phenomena at transit of, *M. B. Synder*……**P16**:390
    Rotation period of……**S9**:167
    surface undisturbed by earth tremors, *F. P. Leavenworth*……**A3**:597
    Transit of 1661 and of 1664, of……**P2**:284
        1882……**S1**: 53
        1891, Observations of……**S10**: 40
          R. B. Fulton, **S10**:377; Lick obs., **S10**:291;

Volume and Page

Mercury, *(Continued)*
  Transit of 1891, *H. S. Pritchett,* S10:289; *T. D. Simonton,* S10:289; *M. B. Snyder,* S10:292; Univ. of Mo., S10:289; U. S. Naval obs., S10:289; *M. A. Veeder,* S10:291; Warner obs., S10:290; Washburn obs., S10:290.
    1894, Observations, Agricultural college, S. D., A3:868; P2:188; Chabot obs., A3:868; P2:188; Davidson obs., A3:866; P2:187; Dearborn obs., P2:188; Goodsell obs., A3:869; *D. A. Hadden,* P2:233; Halsted obs., A3:868; P2:188; *H. A. Howe,* A2:88; Leander McCormick obs., A3:868; P2:188; Lowell obs., A3:865-6; P2:185; *E. S. Martin,* P2:232; Notes A3:704, 779, 866; P2:93, 168.
    1907 visible in U. S., *W. F. Rigge* P15:488
    1907 of, Observations—
      Detroit obs., P16:63; Drake univ., P15:644; Flower obs., P15:643; Goodsell obs., P16:62; Harvard obs., P15:643; P16:128; Ladd obs., P15:643; *M. G. Merritt,* P16:188; *M. Moye,* P16:62; *A. G. Sivaslian,* P16:393; Syrian Protestant college, P16:128.
  Visibility of, *J. H. Eadie* P9:462
    G. S. Jones P9:367
Meridian circle at Cincinnati observatory, *J. G. Porter* S8: 3
    Goodsell observatory, *W. W. Payne* S6:302
  Division errors of, *Director Keyser* S3: 33
  Index error of, *W. A. Rogers* S2:138
  settings, Device for facilitating, *W. E. Cooke* P10:365
 conference S4: 14
 counterpoises, *E. S. Holden* S1:310
 instruments, Mounting of fixed P11:516
 line, Establishing, *G. C. Comstock* P9:246
 observation, Constant error of, *J. G. Porter* P13:117
 observations, How to make good, *T. H. Safford* S10:113, 209, 401
Merope nebulae, Drawing by E. E. Barnard of S1:24, 57
Meteor comets, *W. H. S. Monck* S8:208
 explosion S10:106
 paths, Maps for tracing, *T. W. Backhouse* S5:114
 radiants S1:199; S3:236
  W. F. Denning S5: 61, 167, 309; S6:160, 287, 356; S7:447; S9:438; S10:234, 295; A3:600, 872.
  W. H. S. Monck S9:363, 454; S10:109, 126, 295, 300; A3:334, 782.
  W. W. Payne, Chart of P7:337
 streams, Comet, *S. J. Corrigan* S5:145

Volume and Page

Meteor, *(Continued)*
trail, Photograph of Leonid **P10**:497
seen at Grahamstown, 1895, *L. A. Eddie* **P3**:271
train, *W. R. Brooks* **S3**:167
trains drifting, *E. E. Barnard* **S1**:174; **S10**:426
Meteors, Celestial phenomena explicable by, *W. H. S. Monck* **S9**:260
Double, *L. Swift* **S1**:108
Heights of, *W. F. Denning* **S8**:299
Leonid, *W. H. Pickering* **P12**:530
Leonids, Balloon observations of **P11**:220
Case of the, *J. B. Wood* **P10**:459
Importance of accurately observing, *G. J. Stoney* **P4**:134
Orbit of the, *W. W. Payne* **P8**:523
Period of revolution of, *W. H. Pickering* **P10**: 8
Perturbations of, *G. J. Stoney* and *A. M. W. Downing* **P7**:227
Shower of, *H. C. Wilson* **P6**:568
Non-appearance of, *W. H. Pickering* **P7**:523
stream, Ephemerides of two situations in, *G. J. Stoney* and *A. M. W. Downing* **P7**:403
Observed: **S2**:148; **S5**:317; **S9**:41; **P14**:251; *H. W. Griggs,* **P14**:571; *E. F. Loomis,* **P16**:394; *E. L. Moseley,* **P12**:190; *R. O'Halloran,* **P3**:213; *A. A. Veblen,* **P16**:128; *A. S. Young,* **P16**:587.
Andromeda, 1899, **P8**:50; *G. Davidson,* 1892, **A2**:86; *R. M. Dole,* **P8**:51.
Aquarid, 1902 .... **P10**:498
Bielid, 1885, *E. E. Barnard,* **S5**:74; *J. H. Eadie,* **S5**:26; *W. W. Payne,* **S5**:11; *C. A. Young,* **S5**:23.
1892, *E. E. Barnard* **A1**:943
1899, *G. W. Meyers,* **P8**:13; *C. A. Young* **P7**:542
Draconid, 1907, *W. F. Denning* **P16**:198
Leonid, 1882 .... **S1**:237
1896, *A. S. Young* **P4**:498
1898, *C. D. Perrine,* **P6**:553; *E. C. Pickering* .. **P6**:309; **P7**: 46
1899, *W. W. Payne,* **P7**:393, 475, 524; **P8**:15; *E. C. Pickering,* **P7**:412; *W. H. Pickering,* **P7**:395.
in India, *M. E. Moulton* **P8**:104
New York **P8**: 52
Park college, *F. P. Brackett* **P8**:163
1898-1900, *J. K. Rees* **P9**: 79
1900, *E. M. Bardwell,* **P7**:49; *F. P. Brackett,* **P7**:30; **P8**:569; *W. A. Cogshall,* **P7**:71; *E. N. Fought,* **P7**:50; *P. W. Jenkins,* **P7**:47; *F. E. Millis,* **P7**:47; *W. C. Mills,* **P7**:101; *W. E. Sperra,* **P7**:101; *L. G. Weld,* **P7**:17; Vassar college, **P8**:566.
1901, *W. C. Brenke,* **P10**:105; Ia. Wes. Univ., **P10**:164;

Volume and Page

Meteors observed, *(Continued)*
Leonid, 1901, *E. L. Larkin,* **P10**:16; *W. W. Payne,* **P10**:559; Pomona college, **P10**:165; *J. K. Rees,* **P10**:107; *R. B. Taber,* **P10**:403; Univ. Lawrence, **P10**:220; Univ. Minnesota, **P10**:161.
1902, *R. M. Dole,* **P10**:50; Ladd obs., **P10**:48; *L. G. Léon,* **P11**:53; *W. H. Pickering,* **P10**:400; **P11**:6; *W. P. Russell,* **P10**:53; *J. Salloms,* **P10**:51; *F. E. Seagrave,* **P10**:54.
1903, Leander McCormick obs., **P11**:581; Univ. Ill., **P11**:582; *W. Upton,* **P12**:67; Yerkes obs., **P11**:580.
1904, Brown univ., **P13**:54; Drake univ., **P13**:54; Harvard, **P13**:56; Ill. univ., **P13**:55; Mt. Holyoke college, **P12**:683.
1906, *C. P. Olivier* **P15**: 59
Lyrid, 1882 .... **S1**: 99
1900, *R. M. Dole* **P8**:348
1907, *W. F. Denning* **P15**:168
Orionid, 1900, *R. M. Dole* **P8**:520
1901, *R. M. Dole* **P10**: 50
1904, *C. P. Olivier* **P12**:680
Perseid, 1882, *D. Kirkwood* **S1**:141
1899, *J. A. Miller* **P7**:406
1891, *E. E. Barnard* **S10**:470
1901, *R. M. Dole,* **P9**:523; *D. Kirkwood,* **P9**:413; *W. M. Mitchell,* **P9**:522; *C. P. Olivier,* **P9**:525.
1902, *R. M. Dole,* **P10**:499; *C. P. Olivier* **P10**:555
1904, *R. M. Dole* **P13**:347
Orbits of, *W. H. S. Monck* **S10**:328
O. C. Wendell **S4**:55; **S7**: 47
Patches of, *W. F. Denning* **P10**:121
Perseid and Lyrid, *R. M. Dole* **P11**:514
Photographing, *W. L. Elkin* **A3**:626; **P2**: 17
Photographs determining parallax of, *J. M. Schaeberle* and *A. L. Colton* **P5**:232
velocity of, *W. L. Elkin* **P7**:441
Photography of, *E. E. Barnard* **P5**:281
Telescopic, *W. F. Denning* **P15**:170
J. H. Metcalf **P15**:29; **P16**:588
ζ Ursids, *R. M. Dole* **P8**:346
and meteorites, *W. H. S. Monck* **S8**:395
stellar scintillation, *I. E. Christian* **P1**:414
Meteoric astronomy, *D. Kirkwood* **A2**:385, 789; **A3**:188
orbits and radiants, *S. J. Corrigan* **S5**:100
phenomena, *E. F. Sawyer* **S1**:91, 150
showers, Cometary, *W. F. Denning* **S5**:106

Volume and Page

Meteoric showers, *(Continued)*
  W. F. Denning P13:107
  notes on S4:299; S9:141
  1897, *W. H. Pickering* P6:294, 326
  1898, *H. C. Wilson* P6:502
  1903, at Leander McCormick observatory P11:512
Meteorite, *E. S. Martin* A3:172
Meteorites S9:40, 137, 283
  meteors, and shooting stars, *H. A. Newton* S6:65, 98, 127
  Mexican A1:351; P10:558
  Note on brilliant, *N. H. Winchell* P12:553
  or aerolites, *W. H. S. Monck* .... P11:357; Cor. P11:522
  Pennsylvania, *J. W. Miles* P16:458
  Probable origin of, *G. W. Coakley* A1:753
Meteorology on Pacific Slope, *J. S. Ricard* P16: 92
Meter and wave-length of cadmium light compared, *A. A. Michelson* A2:556
Metrological society, American, *J. K. Rees* S9:335
Metrology at Northwestern university S7:398
Micrometer, Bright-wire illumination for, *S. W. Burnham* S1:110
  for measuring astro-photographic plates, *W. H. M. Christie* A2:588
  Handy, *N. M. Mann* S3: 10
  Illumination for a position, *G. W. Hough* S9:161
  observations of comets Faby and Barnard, *C. L. Doolittle* S5:256
  screw, Brass S6:229
    value of one revolution of, *G. C. Comstock* .... S7:343; Cor. S7:409
  Value of filar, *C. B. Hill* S7:311
Migrating birds, Determining heights of, *J. Stebbins* P14: 65
Mile, English, *J. M. Clark* S9:155
Milky Way in autumn heavens, *R. O'Halloran* P10:372
  Best method of observing, *A. Pannekoek* P5:524
  Boeddicker's Drawings of the S8:468; A1:538
  Charts for inserting, *A. Pannekoek* P5:485
  Necessity of further reseaches on, *A. Pannekoek* P5:395
  Photographing, *E. S. Holden* S8:424
    H. C. Wilson P3: 58
  and theory of gases, *H. Poincaré* P14:475
Minor planets, (See Asteroids)
  Facts about, *J. K. Rees* P6:339
  Photographic observations of, *M. Wolf* A2:109, 779
  and short period comets compared, *M. O. Callandreau* P12:117
    their names P11:546
Mira, *o Ceti,* (See Variable Stars, Cetus)
Mira and W *Lyrae,* Light curves of, *R. O'Halloran* P15: 95
Mirage, *C. M. Charroppin* P5: 23
"Mirage" from blast furnaces, *L. D. Hayes* P16:321
Mirage, Night, *W. E. Sperra* P16:164

	Volume and Page
Mirror for reflecting telescopes, *F. L. O. Wadsworth*	**P5**:518
solar observatory, 100-inch, *G. E. Hale*	**P14**:557
Mirrors, Aberration of parabolic, *J. M. Schaeberle*	**P6**: 38
Miscellany, *R. W. McFarland*	**P13**:531
Mitchel, O. M., "Old Stars," *O. E. Harmon*	**P5**:413
Monoceros, Nebula in, *E. E. Barnard*	**S4**:313; **A3**:642
Moon, *A. Marth*	**S1**:208
W. W. Payne	**P1**:16, 45, 289; **P2**:67; **P3**:176; **P4**:143, 242
Atlas of, Mm. Loewy and Puiseux, *W. W. Payne*	**P11**: 25
L. Weinek	**P5**:240
Bright rays of the, *H. G. Tomkins*	**P15**:296
streaks from craters of	**S9**:281
Change in crater Pliny	**S8**:376
Color of eclipsed, *J. E. Keeler*	**S4**:311
Formations of the, *W. H. Pickering*	**P10**: 57
Gigantic artificial, *Scientific American*	**P7**:107
Harvest, *E. A. Bowen*	**P1**: 32
hoax, *S. A. Mitchell*	**P8**:256
Map by J. A. Colas of	**A3**:787
Motion of the, *Nature*	**P14**:140
observations in Mexico, *L. G. Léon*	**P11**:276
Place of origin, *W. H. Pickering*	**P15**:274
in Praesepe, Occultation of, *A. R. J. F. Hassard*	**P16**:328
Rills on the, *P. Fauth*	**P15**:490
Temperature of	**S4**:310
Theory of surface markings of, *E. Miller*	**P3**:273, 383
Wet and dry, *A. K. Bartlett*	**P9**:442
and thunderstorms, *A. B. MacDowall*	**P10**:222
F. E. Seagrave	**P10**:332
weather, *A. K. Bartlett*	**P10**:368
W. H. Pickering	**P11**:327
wet days	**P9**:464
Moon's auroral glow, *J. Haywood*	**S3**:121
heat, Distribution of	**S10**:471; **A1**:347
motion, Theory of	**S10**: 47
secular acceleration, *I. E. Christian*	**P7**:329
synchronous rotations, unexplained, *R. M. McCreary*	**P4**:575
Moonrise, Time of, *W. F. Rigge*	**P13**:550
Motion of atmosphere at high elevation, *L. Swift*	**S9**:472
a heavenly body in resisting medium, *G. A. Bliss*	**P6**: 20
pole, Latest knowledge of, *S. C. Chandler*	**P6**:509
stars in line of sight, *E. C. Pickering*	**S2**:79; **P4**:306
Motions, Commensurability of, *A. Hall*	**S4**:200
D. Kirkwood	**S4**:257
of Jupiter, Saturn and minor planets, Relation between, *D. Kirkwood*	**A2**:302
stars, Potsdam measures of	**A2**:271

Volume and Page

Mound-builders' calendars P2:429
Mount Lowe railway observatory, *E. L. Larkin* P9:360
Mounting telescope at Amherst? New system of, *S. B. Elliott* P10:463
    telescopes, Perfection of, *E. Doolittle* P7:149
Multiplication result, *A. Hall* P9: 31
Nautical almanac office investigation A2:664, 760; A3:413
Navigation, My first lessons in, *T. Lindsay* P5:126
Nebula at M 57, *E. von Gothard* A3:190
    Messier 76, Miniature Dumb-Bell P11:110
    discovered by E. E. Barnard S1:135
    BD + 41°4004, Parallax of Webb's planetary A2:857
    G.C. 4333, *F. P. Leavenworth* S6:293
        4415, Error in Klein's atlas S8:137
    HV 15 = NGC 6960, Photograph of, *H. C. Wilson* P10:432
    surrounding, Nova *Persei*, Motion in, *C. D. Perrine* P10: 9
    Suspected proper motion of, *L. Swift* S5: 60
Nebulae, *L. Swift* S4:1; P10:160
    Burnham's measures of planetary A1:174
    Corrections of catalogues, *F. Muller* S7: 44
    Curious and difficult, *L. Swift* S4:174
    Discoveries at Lowe observatory, *L. Swift* A1:197; P5:426; P6:18, 400
    Motions of planetary S9:403
    New S3:57, 184; S4:53; S5:25; S6:83; S8:38; S10:240; A1:247, 523,
        751; A2:189; P7:223.
        by photography, Annals H.C.O. P9:431
        and old, *L. Swift* A1:566
    News from, *C. A. Young* S9: 27
    observations, *F. Muller* S6:361
    Photographs of, *A. A. Common* S8: 25
    by photography, Discovery and cataloguing small P9:468
    Planetary, *E. C. Pickering* S1:139
    Spectra of, (Magnesia fluting) *G. E. Hale* S10: 23
        J. E. Keeler S10:264
        and new star, *E. von Gothard* A2: 51
    Wonderful, *L. Swift* P1:249
    and clusters, *L. Swift* P1:369
        comet seeking, *L. Swift* P1: 30
        nebulous stars P7:223
Nebular hypothesis, *J. E. Keeler* A1:567, 768
    Prof. Chamberlin on, *F. R. Moulton* P5:508
    of La Place, *G. W. Coakley* S7:132, 191
Nebulosities and clusters in Milky Way, Photographic, *E. E. Barnard* A3:177
    of the *Pleiades* exterior, *E. E. Barnard* A3:768
        Observatory P7:109
        H. C. Wilson P7: 57
Nebulous areas of the sky, *H. C. Wilson* P12:401

	Volume and Page
Nebulous, *(Continued)*	
ring, *L. Swift*	**S9:** 47
Negative enlargements, *W. Zimmerman*	**P13:**484, 556
Neptune, the planet, *E. Holmes*	**P16:** 9
in 1845-6, Search for, *E. S. Holden*	**A1:**287
Satellite of, *F. Tisserand*	**A3:**291
satellites, Measures of	**P6:**255
Neptune's position originally computed, *W. H. Pickering*	**P14:**525
New light from old records, *K. Laves*	**P14:**276
Newspaper astronomy, *R. M. McCreary*	**P6:**103
Newton, Sir Isaac, Eulogy on, *E. Halley*	**P12:**504, 571
N. Y. observatory and nautical museum, *W. W. Payne*	**P14:**349, 380; **P15:**188
Night clouds, Request for observations of, *W. Foerster* and *O. Jesse*	**A1:**859
Non-Euclidean geometry, *G. B. Halsted*	**P7:**482, 519; **P8:**8, 189, 267; **P9:** 555; **P10:**26, 176.
W. H. S. Monck	**P8:**333
and astronomy, *W. H. S. Monck*	**P9:**370
Noon mark, Easy way to make, *E. Riggs*	**P2:** 73
Normae, Nova, *E. C. Pickering*	**A3:**40, 398
Observations of, *W. W. Campbell*	**A3:**311
Numerical calculation, Art of, *F. H. Seares*	**P16:**349
Obituary Notices—	
Allen, Richard Hinckley, *H. S. Davis*	**P16:**189
Argelander, *A. Krueger*	**S2:**197, 229, 276
Bruce, Catherine Wolf, *W. W. Payne*	**P8:**235
Callandreau, M. O., *Nature*	**P12:**288
Clark, Alvan, *W. W. Payne*	**S6:**250
Clark, A. G	**P5:**167
Clark, G. B., *J. A. Brashear*	**A1:**367
Clerke, Agnes M., *H. Macpherson, Jr*	**P15:**165
T. J. J. See	**P15:**323
Common, Dr. A. A., *H. H. Turner*	**P11:**367
Copeland, Ralph, *H. Macpherson, Jr*	**P14:** 1
De la Rue, W	**S8:**281
Ennis, Jacob	**S9:**1, 185
Flanery, David, *P. S. Yendell*	**P8:**400, 484
Gould, Benjamin Apthorp, *S. C. Chandler*	**P4:**341, 387
A. Hall	**P4:**337
Grant, R., *R. Copeland*	**A1:**878
Hall, Asaph, *H. S. Pritchett*	**P16:** 67
Harkness, William, *F. H. Bigelow*	**P11:**281
Henry, Prosper, *O. Callandreau*	**P11:**558
Houzeau, J. C	**S7:**358
Israel, Edward, *M. W. Harrington*	**S4:** 83
Janssen, P. J. C., *H. Macpherson, Jr*	**P16:** 72

Volume and Page

- Obituary notices *(Continued)*
  - Keeler, James E., *J. A. Brashear* **P8**:476
    - *C. D. Perrine* **P8**:409
  - Knapp, M. W **A1**:254
  - Kowalevski, Sophie, *C. C. Barnum* **A1**:281
  - Krueger, C. N. A., *Observatory* **P4**: 54
  - Langley, Samuel P., *J. A. Brashear* **P14**:257
  - Lawton, G. K., *T. J. J. See* **P9**:374
  - Loewy, Maurice, *Bulletin Astronomique* **P16**: 1
  - Loomis, Elias, *H. A. Newton* **S9**:241
  - Lyman, C. S **S9**:142, 400
  - Mitchel, Maria, *M. W. Whitney* **S9**: 49
  - Mitchel, O. M., *J. G. Porter* **S8**:442
  - Newton, H. A., *N. Y. Evening Post* **P4**:236
  - Parkhurst, Henry M., *J. A. Parkhurst* **P16**:231
  - Perry, S. J., *C. M. Charroppin* **S9**:197
  - Peters, C. H. F., *J. G. Porter* **S9**:439
  - Pritchard, Charles, *W. E. Plummer* **A2**:592
  - Proctor, Richard A., *C. R. Willard* **P1**:319
  - Rees, John Krom, *H. Jacoby* **P16**:639
  - Roberts, Isaac, *W. S. Franks* **P12**:469
  - Rockwell, Charles Henry, *W. W. Payne* **P12**:262
  - Rosse, Earl of, *W. W. Payne* **P16**:570
  - Rutherfurd, L. M **A1**:617
    - *J. K. Rees* **A1**:689
  - Scammon, J. Y **S9**:188
  - Schimpff, R. D **S8**: 91
  - Schoenfeld, E., *A. Krueger* **S10**:275
  - Simonton, Thomas D., *S. J. Corrigan* **P16**:466
  - Smyth, C. Piazzi, *R. Copeland* **P8**:384
  - Struve, O. W., *M. Nyrén* **P14**:352
  - Tacchini, Pietro, *H. Macpherson, Jr* **P13**:306
  - Tempel, W., *G. V. Schiaparelli* **S8**:238, 257
  - Trepied, M. C., *M. Loewy* **P15**:519
  - Vogel, H. C., *H. Macpherson, Jr* **P15**:453
  - von Oppolzer, Theodor, *Monthly Notices* **S6**:188
  - Watson, J. C., *G. C. Comstock* **S7**:273
  - Winlock, Anna, *M. E. Byrd* **P12**:254
  - Winlock, W. C., *S. P. Langley* **P4**:351
  - Wolf, Rudolf, *Observatory* **A3**:112
  - Young, Charles Augustus, *J. M. Poor* **P16**:218
- Object-glass grating, *L. E. Jewell* **A3**:44, 155
  - New triple achromatic, *H. D. Taylor* **A3**:696
    - Note **A3**:400
  - struck by lightning **P2**:286
- Object-glasses, Care and cleaning, *J. A. Brashear* **P2**: 9

	Volume and Page
Object-glasses, *(Continued)*	
for two lenses, *A. Steinheil*	S3:225
Putting in place and adjusting, *J. A. Brashear*	P2: 57
Objective may lose figure	P16:256
Construction of telescope, *C. S. Hastings*	S1:244; S2: 39
prism, *E. C. Pickering*	A1:199
Obliteration data corrected by least squares, *H. Whitaker*	S9:458
from illumination, *H. M. Parkhurst*	S7:337
Observations, Abbott's latitude and longitude, *E. S. Holden*	S1: 64
at Mount Whitney, *S. P. Langley*	S1:131
for beginners, *W. W. Payne*	P3:14, 121
of Chabot observatory	S6:290
Rejection of discordant, *A. Hall*	S6:297
Sudden Phenomena, *S. P. Langley*	S8:291
(For specific observations, see subject)	
Observatories, Ancient and modern, *W. Upton*	S10:481
Free public, *W. W. Payne*	A3:110
Mountain, *E. C. Pickering*	S2:105
New, at Edinburgh	A2:761
Manila	A2:763
of Scotland, *H. Macpherson, Jr*	P15: 65
United States	S1: 8
Popular fallacies about, *M.E.Byrd*	S5:263
work in foreign	S3:129; S4:8, 212
and observers, *C. L. Doolittle*	P11:467
Observatory at Amherst	P10:390
Beloit	S1: 24
Instruments for	S1: 69
Cape of Good Hope, *H. Jacoby*	P3:217
Chamberlin	S10:400
Cincinnati, *O. Stone*	S1: 56
Instruction for students at	S1: 23
Meridian circle at	S9: 46
Dartmouth	S1: 24
Dearborn, *G. W. Hough*	S8:341
H. A. Johnson	S7:381
Dudley, Rebuilding of	A1:630
Goodsell, *W. W. Payne*	S7:321
Greenwich, Work at, *Monthly Notices*	S2: 74
Heidelberg	A3:586
Iowa State University, *L. G. Weld*	S10:474
Jeypore, India, *W. W. Payne*	P11:542
Kenwood physical, *G. E. Hale*	S10:321
Dedicatory address, *C. A. Young*	S10:312
Ladd, *W. Upton*	S10:502
Dedicatory address at, *W. A. Rogers*	S10:491

Volume and Page
Observatory, *(Continued)*
  La Plata, *Bulletin Astronomique* S3:116
  Leander McCormick S1: 98
  Lick S4:46; A1:628
    E. S. Holden S5:225; S7: 49
    Meridian circle, *G. C. Comstock* S1: 65
    Work at, *E. S. Holden* S1:133; S3:301
  Litchfield, endowed S4:202
  Manila, Telescope for, *J. Algué* A3: 85
  McKim, *W. V. Brown* S4:305
  Mississippi university, *R. B. Fulton* S10:382
  National Argentine, *J. M. Thome* A3: 8
  Paris, Elbow equatorial for S10:295
    Photographic meridian telescope for P16:193
    Reflector remodelled for photographic work A2:173
  Princeton university, Construction of large telescope S1: 22
  Sydney S10:523
  Tashkent S1:134
  Underwood, *M. D. Ewell* S10:519
  United States Naval S1:61; A1:630
    R. Copeland S3:270
  Washburn, *H. S. Pritchett* S1:126
  Windsor, *E. L. Larkin* S1:132
  Yale university, Horological bureau of S1: 22
  Yerkes, *G. E. Hale* A1:790
 An amateur's, *J. H. Metcalf* P14:211
 Dual, *J. D. Parker* P14: 96
 First college in U. S. to have, *J. L. Love* S7:417
 Latitude of Ann Arbor S8:334
      Detroit S8:285
      Lick S5:302
 Local patronage for, *W. W. Payne* S9:65, 113, 139, 231
    threatened S8:452
 Locations, Expeditions for ascertaining, *P. Lowell* P11:144
 Longitude at Goodsell S8:474
 Mountain station, *W. H. Pickering* A1:353
 "National" vs. "Naval," *L. Boss* S10:161
 Need of free astronomical, *F. Armitage* P1:273
 Novel, *C. F. Harms* P12: 73
 publications of U. S., listed, *H. O. Severance* ..... P15:517; Cor. P16:126
      and reports, (See Reviews)
Observer, Requisites for transit, *G. A. Hill* P13:362
Observing seat for equatorial, *G. W. Hough* S1: 47
Occultation phenomena, *T. Lindsay* P6:524
Occultations, *J. Morrison* P5:417
  Method of computing, *C. L. Woodside* S5:203

	Volume and Page
Occultations, *(Continued)*	
of stars by the moon, *G. W. Hough*	**P5**:451
star clusters, Graphical computation of, *W. E. Sperra*	**P6**: 76
Oceans, Stability of equilibrium, *T. J. J. See*	**P3**:178
70 *Ophiuchi, S. W. Burnham*	**A2**:585
J. E. Gore	**S10**: 45
Discovery of triple, star	**P3**:268
F 70 *Ophiuchi,* Discovery of unseen body, *E. Doolittle*	**P3**:329
70 *p Ophiuchi*	**P14**:507
70 *p Ophiuchi* Nebula and smallness of ground-work stars, *E. E. Barnard*	**P5**:227
τ Ophiuchi, Orbit of, *S. W. Burnham*	**P4**:347
U *Ophiuchi,* New elements	**P11**:453
Optical illusion, Curious, *A. K. Bartlett*	**P12**:123
Orbit of a body approaching the sun, *G. W. Coakley*	**S10**:305
bodies under action of central attraction, *R. W. Wood*	**P8**: 32
Graphical method for elements for parabolic, *F. R. Moulton*	**P7**:193
Orbits,—See name of body.	
Computation of meteoric, *S. J. Corrigan*	**S5**: 33
parabolic	**S1**:217, 247
Determination of, *A. Hall*	**P13**:353
from 3 observations, *A. O. Leuschner*	**P13**:296
of Meteors, *O. C. Wendell*	**S5**:111
Orbital motion of sun and stars, *E. B. Whitmore*	**S8**:332
Orientation of field of view of telescope, *E. T. Whitelow*	**P15**: 22
Orion, Burnham on the Trapezium of	**S8**:268
Great, photographic nebula of, *E. E. Barnard*	**A3**:811; **P2**:151
W. H. Pickering	**S9**: 1
L. Swift	**P1**:157
H. C. Wilson	**P1**:433
Note	**S8**:225
Red fringe to the	**A3**:504
Spectrum of, *W. W. Campbell*	**A2**:927; **A3**:384
E. S. Holden	**S1**:66, 104
Mr. and Mrs. Huggins	**S9**:303
Summary of monograph of, *E. S. Holden*	**S2**: 77
Variable stars in, *E. C. Pickering*	**P12**:332
nebulous system visible in small telescope, *C. C. Hutchins*	**S10**:204
New star in Trapezium of	**S7**: 88
Night with, *W. Noble*	**P4**:428
Orionids,—See Meteors.	
α Orionis, Variability of	**P11**: 51
β Orionis (= *β* 555), Companion to, *R. G. Aitken*	**P6**:585
θ Orionis	**S7**:217
U *Orionis,* Light curve of	**P12**:143
U *Orionis,* Observation of, *F. E. Seagrave*	**P12**:145
Orthographic projection of the sphere, Problem, *W. F. Rigge*	**P14**:402

Volume and Page

Oscillations of solar activity and climate.......P13:576
Oval and ellipse, Eight-centered, *F. R. Honey*.......P16:617
Pair of ancients, *C. C. Hutchins*.......S10:214
Palissa, Discoveries of asteroids S1:23, 63, 71; S2:31, 92; S3:153, 181, 223; S5:151, 318; S6:231, 328; S7:169, 260; S9:182, 469.
Parabolic mirrors, Corrections and testing of, *F. L. O. Wadsworth*.......P10:337
Parallax, Aberration and solar, *A. Hall*.......S2:165
of *μ Cephei* by Ball.......S1: 67
first magnitude stars, *W. L. Elkin*.......S7:395
Lesson in, *O. E. Harmon*.......P1:403
of *α Lyrae* and 61 *Cygni*.......S2:1; S5:311
of O Arg. 14320, *F. P. Leavenworth*.......A2:206
by photography, Stellar, *C. Pritchard*.......S7:173
Pearsons, Dr. D. K., *W. W. Payne*.......P12:345
37 *Pegasi*, Orbit of, *S. W. Burnham*.......A2:678
U Pegasi, Variable star 8598, *P. S. Yendell*.......P3:400
E. C. Pickering.......P6: 29
Peirce to American mathematics and astronomy, Services of, *T. J. J. See* P3: 49
Pendulum escapement, *Mr. Leman*.......A2:882
Persei, Nova, Antonadi, P9:459; *W. C. Brenke*, P9:357; *M. Brooks*, P9:283; *A. E. Douglass*, P9:263; *C. Flammarion*, P9:459; *D. E. Hadden*, P9:282, 355, *G. E. Hale*, P9:264; *G. L. Jones*, P9:573; Ladd obs., P9:220; *R. O'Halloran*, P9:354; *C. P. Olivier*, P10:56, 274; *E. C. Pickering*, P9:184; Pomona college, P9:221; *F. E. Seagrave*, P9:217, 283, 519; P10:47, 158; P11:224, 344; P12:358; Univ. Va., P9:356; Whitin obs., P9:220; *M. W. Whitney*, P9:574-5; *M. Wolf*, P9:459; *H. C. Wilson*, P9:197; P10:74, 158, 331; *A. S. Young*, P9:357; Yerkes obs., P9:218.
Brightness of, *H. C. Wilson*.......P9:409
Chart and catalogue for, *J. G. Hagen*.......P9:191, 279
Color variation of.......P10: 47
Comparison stars for.......P10:274
Light curve of, *H. C. Wilson*...P9:447, 479, 545; P10:31, 91, 144, 199, 257, 316.
Measures of P10:384
Motion of nebulae near, *J. C. Kapteyn*.......P10:124
Nebulosity of P10: 48
Proper moiton and parallax of.......P10:330
Spectrum of, *L. Becker*.......P12:603
and brightness of.......P16:388
Triangulum and Hydrae, Novae, *M. Fleming*.......S10: 7
20 *Persei* (*β* 524), *S. W. Burnham*.......A2:404

Volume and Page

20 *Persei* (β 524), *(Continued)*
S. Glasenapp **A2**:499
U *Persei,* a comparison star for *Eros* **P10**:378
No. 2 Nova, *E. C. Pickering* **P9**:282; **P10**:546
F. E. Seagrave **P9**:283
Perseids,—See Meteors.
Personal equation machine, *W. W. Payne* **S10**:139
Perth observatory meridian work, *W. E. Cooke* **P15**:499
Perturbations of the heavenly bodies, *F. R. Moulton* **P6**: 88
and the perturbative functions, *J. Morrison* **P8**:309; **P9**:130, 249, 436
Peters' celestial charts, *B. D. Gilbert* **S1**:288
observations treated by Chandler, *F. Folie* **A2**:874
Peters-Borst star catalogue **S8**:138, 455; **A3**:417; **P1**:428
Phenomenon, Remarkable, *F. Campbell* **P11**:484
Suggested explanation, *M. A. Veeder* **P11**:486
Philippine firmament, *R. O'Halloran* **P7**:201
Phoebe in May and June, 1906, *E. C. Pickering* **P14**:506
Phoenix, Explanation of the Egyptian, *T. J. J. See* **A1**:457
Photo-electric cells, *G. M. Minchin* **A1**:702
effect of starlight, *S. M. Dixon* **A1**:844
W. H. S. Monck **A1**:843
Photographic chart of the sky, *W. F. Denning* **P5**: 62
H. Jacoby **A2**:117; **P4**: 53
— Mouchez **S7**:451
Observatory **A3**: 20
W. W. Payne **P12**:651
H. H. Turner **P11**:433
H. C. Wilson **S8**:379; **A1**:632; **A3**:260
Notes, **S8**:284; **S9**:378, 428; **S10**:378; **P4**: 45; **P16**:129.
committee, Work of, *Observatory* **S8**:412
conference report, *S. J. Brown* **P8**:355
enlargement lens, *S. W. Burnham* **A1**:558
halation and its remedy **A1**:236
lens, Hastings-Brashear **P10**: 55
work at Columbia observatory, *H. Jacoby* **P3**:211
Harvard, *E. C. Pickering* **S9**:328
and photometric stellar magnitudes **A1**:437
Photographing with a non-photographic telescope, *E. E. Barnard* **S10**:331
sky, Preparations for, *H. C. Wilson* **S7**:91, 263
Photographs, Long exposure **P9**:413
Photography applied to astronomical research, *E. E. Barnard* **P6**:425
H. H. Turner **P13**:72, 122
Camera for celestial, *S. W. Burnham* **S10**:325
Depth of definition in **P14**:184
high altitude, Celestial, *H. C. Wilson* **P12**:509

Volume and Page

Photography, *(Continued)*
Making of, *C. F. Himes* P8: 26
of colors A1:524
of heavens, *G. Boccardi* P12:521
and invisible solar prominences, *G. E. Hale* S10:257
and meridian observations, *T. H. Safford* S9:193
Photometer for determining star magnitudes, *W. E. Wilson* A1:307
meridian measurements S10: 46
Wedge, *E. C. Pickering* S1:105
(Compound), *E. J. Spitta* S9:163
Photometers, Polarizing, *E. C. Pickering* P6: 60
Photometric measurements in Palissa charts S4:133
observations criticized by Dr. Chandler, Harvard A3:399
Photometry, Catalogues of meridian S4:163
Harvard and Oxford, *W. H. S. Monck* S7: 92
Revised (note) P12:282
Instrumental, *H. M. Parkhurst* S5:230
Photographic, *E. S. Holden* S9:121
Stellar, *H. M. Parkhurst* S4:273
Physical science, Recent advances in, *W. Crookes* P6:493
Piazzi stars, Nomenclature of, *H. S. Davis* P13:423
o Piscium, Occultation of, *H. A. Howe* A2: 89
Planet beyond Neptune, Photographic search for, *I. Roberts* A1:554
launching, *T. C. Ryan* P16: 17
tables, Using Newcomb's, *R. Buchanan* P15:133
T. G., The new, *A. C. D. Crommelin* P14:472
Planet's anomaly and radius vector, *K. Laves* P16:189
F. Rust P16: 36
rotation and revolution times, *G. W. Coakley* S10:217
satellites, Determinations of dimensions of, *E. E. Barnard* P5:285
Planets, Dimensions of small, *D. Todd* A2:313
Early conjunction of, *W. H. S. Monck* P8:238
Elements of (488), (490), (492), (494) P11:452
Equinoxes of, *R. Buchanan* P13:282
Gravity on surface of, *R. W. McFarland* S2:150
inhabited? Are other, *R. Challice* P11:417
R. W. McFarland S2:217
D. G. Parker P10:357
D. E. Wing P11:536
Mean motions of the, *S. Newcomb* S3:280
Motions of, *F. R. Moulton* P11:284
Photometric observations of the, *E. B. Frost* A2:619
Semi-diameter of the, *R. Buchanan* P13:209
Spheres of activity of, *A. Hall* P7:180
F. R. Moulton P7:281
Stability of nebulous, *D. Kirkwood* S4: 65

	Volume and Page
Planets, *(Continued)*	
Visual brilliancy of, *R. Buchanan*	**P13**:175
and cyclones, *W. W. Payne*	**S3**:104
Planetary bodies, Law of density of	**S8**:471
detail, Study of, *T. J. J. See*	**P4**:550
Kind of eye needed for detection of, *P. Lowell*	**P13**: 92
observation, *W. F. Denning*	**P11**: 19
photography with reflecting telescope, *J. M. Schaeberle*	**P3**:280
work at Lowell observatory, *A. E. Douglass*	**P7**: 74
Planetoid DQ (433) 1898, See *Eros.*	
Planetoids,—See Asteroids.	
discovered by Palissa,—See Palissa.	
Photography of, *E. S. Holden*	**P3**:343
Plates by bathing, Non-screen orthochromatic and panchromatic, *E. König*	**P15**:620
Platinum-on-glass mirrors, *C. C. Hutchins*	**A3**:858
Pleiades, W. W. Payne	**P1**:456
Number of stars in the, *E. S. Holden*	**S3**:117
Occultation, 1894	**P2**:236, 334
H. C. Wilson	**P2**:176
Stars of, *H. M. Paul*	**S3**:161
Yale measurement of, *A. M. Clerke*	**S6**:254
and two asteroids photographed, *H. C. Wilson*	**A3**:192; **P1**:322
Plummet bead, Path of shadow of, *E. Hayes*	**P16**:279
Plus probans quam necesse est, *A. Hall*	**P7**: 13
Polar inversion of the planets and satellites, *W. H. Pickering*	**A2**:692
motion, 1891-2, Six years' cycle, *H. Kimura*	**P12**:270
Polaris and companion, *J. H. Eadie*	**S9**:427
observations	**P7**:443
Polarization of undiffracted ultra-red radiations, *C. A. Perkins*	**A2**:847
Polarized reflections in Nicol's prisms, *E. J. Spitta*	**S9**:266
Pole of the earth on its surface, Motion of north, *W. W. Payne*	**P14**:513
Pope and the comet, *W. F. Rigge*	**P16**:481, 656
Popocatepetl, Ascent of, *A. E. Douglass*	**P5**:505
Position angle observations, *F. P. Leavenworth*	**S10**:116
Positions determined near plate borders, *S. C. Chandler*	**P7**:286
Positive photography with reference to eclipse work, *F. E. Nipher*	**P9**: 24
Potsdam measures for the astrographic chart	**P7**:389
Precession, Auxiliary quantities	**A3**:87; **P3**:437
Constant of	**S1**:267; **S3**: 92
and Assyriological discoveries, *Observatory*	**P12**:426
Prediction of fine seeing, *D. P. Todd*	**S5**:113
Pressure of light, Astronomical consequences, *J. H. Poynting*	**P15**:626
Principia, Second centennial of	**S6**:217
Prizes, Astronomical Journal, etc.—See Awards.	
Probability, Theory of, *T. Lindsay*	**P4**:240

Volume and Page
Procyon, Variable proper motion of, *S. W. Burnham* **A3**:434
Prominence, Solar, *J. B. Coit* **P12**:455
  H. Deslandres **A1**:502
Prominences, by E. E. Read, Jr., Observations of eruptive **A1**:335
  1891, note **A1**:240
  1892, *J. Evershed, Jr* **A2**:365
    J. Fenyi **A1**:609
  1894, *D. E. Hadden* **P2**: 45
  Hypothesis regarding nature of, *H. C. Wilson* **P10**:501
  and faculae, April 16, 1893, *G. E. Hale* **A2**:450
  and reversal of D lines, *W. E. Woods* **A3**:159
Pronunciation of star names **P5**:111
Proper motion of the stars, *W. H. S. Monck* **A1**:874
    as criterion of distance, *J. G. Porter* **P6**:549
    and spectra of stars, *W. H. S. Monck* **A2**: 8
  motions, Table of **S4**:183
Protuberance, Brilliant solar, *D. E. Hadden* **P4**:335
Protuberances, Two great, *J. Fenyi* **A3**:122
  of August, 1905 .... **P15**:314
Publications and reports:—
  Astrographic observatory **P9**:462; **P16**:391
  Astronomical society of the Pacific **S9**:429
  Athens observatory ....
  Berlin observatory **A2**:281
  B. A. A **P12**:681; **P15**:318
  Cambridge observatory **P14**:126
  Cape of Good Hope observatory **P8**:290; **P9**:411
  Cincinnati observatory **S7**:120; **A2**: 91
  Cordoba observatory **S10**: 46
  Dearborn observatory **S1**:168
  D'Abbadia observatory **P15**:125
  Dominion observatory **P16**:195
  Edinburgh observatory **P15**:187
  Greenwich observatory **P5**:275; **P6**:308; **P7**:391
  Harvard college observatory **S2**:57; **S9**:281; **S10**:46, 153; **A2**:176; **A3**:171, 586, 598; **P5**:226; **P8**:89.
  Haverford college observatory **A1**:540
  Journal, Astronomical society, Canada **P15**:257
  Karlsrühe observatory **A2**:281
  Kiel observatory **P7**:442
  Leander McCormick observatory **S9**:423
  Lick observatory **S7**:119; **A3**:416, 784
  Lyons observatory **A2**: 92
  Melbourne observatory **S9**:232
  Morrison observatory **S7**:219, 266
  Munich observatory **P7**:279

Volume and Page

Publications and reports, *(Continued)*
  Nice observatory **S7**:40; **S10**:297; **P5**:274; **P7**:441
  O'Gyalla **observatory** **A2**:645
  Paris observatory **S10**:296; **A1**:540; **A2**:474; **P5**:226; **P7**:442
  Potsdam observatory **P6**:366; **P7**:389, 442; **P15**:59, 314
  Poulkowa observatory **A3**:597
  Prague observatory **A2**:471
  R. A. S. Memoirs **S9**:421
  Royal Irish Academy **A3**:779; **P14**:124
    observatory, Edinburgh **S10**:301
      Greenwich **P14**:312; **P15**:121
  Solar Observatory, Mount Wilson **P13**:223
  Stonyhurst observatory **A3**:316
  Tebbutts' observatory **A2**:939
  Toulouse observatory **P10**:168
  U. S. Naval observatory **S10**:157; **P5**:501; **P14**:126, 578
    science expedition **S9**:238, 330
  Vassar college observatory **P8**:518
  Vatican observatory **A1**:632
  Wanganui observatory **P14**:122
  Warner observatory **S6**:119
  Washburn observatory **S1**:168; **P3**:535; **P11**:163, 459
  Wolsingham observatory **A1**:350; **A2**:382; **A3**:240
  Yale observatory **S1**:132; **S9**:142; **P7**:391
ξ *Puppis*, Spectrum of, *E. C. Pickering* **P9**:222
Quartz fibre, *C. C. Hutchins* **S9**: 90
Radial motion of stars with siderostat, *D. Deslandres* **A1**:157
  velocity spectrograms, Reduction of, *R. H. Curtis* **P15**: 68
    of 20 stars by Frost and Adams **P12**:532
    2 stars, Variable **P12**:287
  velocities of δ *Aquilae* and φ *Persei* **P11**:344
Radiant energy, Absorption of **A1**:823
    through gaseous media, *S. J. Corrigan* **A1**:1, 108
    Probable effects of, *S. J. Corrigan* **A1**:362
  points of meteoric showers,—See Meteor Radiants.
Radiation of (heated) gases, *H. Crew* **A3**:587
      R. R. Tatnall **A3**:153, 859
    (rarefied) by K. Angström line **A2**:647
    motion of comets, Effects of **P13**:282
    the sun, Polar, *F. H. Bigelow* **A3**: 25
Radio-activity **P13**:227; **P15**:126
Radium, Earth's heat caused by **P13**:226
  Life history of **P12**:682
Range finder, Swasey, *W. W. Payne* **P12**:425, 450
Ratio of progression in number and light of stars **P9**:466
Red glows, Origin of, *S. Bishop* **S5**:129

Volume and Page

Red, *(Continued)*
  light, *E. J. Brookings* **S9:**149
      H. C. Maine **S5:**237
  stars for color effect in parallax work, Observations of **P14:**488
    near Nova *Velorum* **P16:** 63
    Position of, *E. S. Holden* **S1:**102
  sunsets, *J. R. Hooper* **S5:**126
    Note on **S4:** 25
    W. W. Payne **S3:** 18
Reduction of R. A.'s of normal system to fundamental, *E. S. Holden* **S1:** 46
Reflecting telescopes of large angular apertures, Failure of, *J. M. Schaeberle* **P5:**315
Reflector in America, *W. W. Payne* **P8:**510
Reflectors, *D. W. Edgecomb* **P2:**366
    vs. refractors, *A. B. Dupuy* **S8:** 88
Refraction, Cause of, *H. M. Parkhurst* **S10:** 16
  of rays of great wave-length, *H. Rubens* and *B. W. Snow* **A2:**231
  on the measures of double stars, Effects of, *E. Doolittle* **P5:**143
  phenomenon yet unexplained, *A. H. Babcock* **P7:** 51
  tables, Leo de Ball's, *L. Courvoisier* **P15:**456
  Untried method of determining, *G. A. Hill* **P13:**417
  in zenith distance, *G. C. Comstock* **S9:**186
  and aberration, Constants of, *G. C. Comstock* **S6:**310
Refractive index of liquid air, *Phil. Mag* **A3:** 64
Refractor (24-inch) of Lowell observatory, *T. J. J. See* **P4:**297
Refractors of the world, List of large **P6:**310, 420
Repulsive forces in nature, *T. J. J. See* **P10:**505
Reseau, Use of the, *H. C. Wilson* **P8:**562
Resisting medium in space, *A. Hall* **S8:**433
Reversing stratum, Its spectrum and that of the corona, *C. A. Young* **P5:**333
Reviews:—
  Allen, R. H., Star names and their meanings *(W. W. Payne)* **P7:**427
  Bailey, F. H., Primary phenomenal astronomy **S5:**128
  Ball, Sir R. S., Star-Land **S10:**524
  Barlow, G. W. C. and G. H. Bryan, Elementary mathematical astronomy, **P1:** 96
  Barnard, E. E., Micrometrical observations of planet Eros **P12:**286
  Brennan, M. S., New and old astronomy **S9:** 96
  Bryant, W. W,. History of astronomy, *(Observatory)* **P16:** 80
  Burnham, S. W., Double star catalogue *(R. G. Aitken)* **P8:**228; **P15:**404
    Double star measures, 1900 and 1901 .... **P12:**282
    Micrometrical measures of 748 double stars *(W. W. Payne)* **S3:** 88
  Byrd, M. E., Laboratory manual of astronomy **P7:**111
    Questions on the sky **P1:** 92
  Campbell, W. W., Handbook of practical astronomy **A1:**544
  Chamberlin and Salisbury, Geology *(F. R. Moulton)* **P14:**327

Reviews, *(Continued)*	Volume and Page
Chambers, G. F., Descriptive astronomy	S5:94; S8:272, 431
Handbook of descriptive and practical astronomy	S9:287, 383
Pictorial astronomy for general readers	S10:480
Charlier's general disturbance of Thetis by Jupiter	S6:199
Clark, L., Star-Guide	S5:191
Clerke, A. M., Astronomy during 19th century	S5:158
Concise knowledge library,—astronomy, *(H. S. Davis)*	P6:190
Herschels and modern astronomy	P3:154
History of astronomy	A2:846
Modern cosmogonies, *(T. J. J. See)*	P14:313
Planet Venus	A2:767
System of the stars	S10:158
(W. W. Payne)	P14: 71
Colas, J. A., Poole Brothers celestial handbook and celestial planisphere	A2:382
Colbert, E., Mathematical tables to 4 places and fraction	S6: 44
Tracing the fixed stars	S6: 43
Collins, C., Introduction astronomy	S9:382
Comstock, G. C. Field of astronomy for beginners	P16:590
Field astronomy for engineers	P11:111
New text-book of astronomy	P9:288
Cosand, J., New theory of the universe	P15:125
Czapski, S., Theorie der optischen instrumenten nach Abbe, *(H. Crew)*	A3:241
Davis, J. W., Theoretical astronomy	S10:479
Denning, W. F., Telescopic work for starlight evenings	S10:303
Doolittle, C. L., Astronomy applied to geodesy and navigation, *(H. A. Howe)*	S5: 63
Practical astronomy	S4:255
Doolittle, E., Catalogue and re-measurement of Hough double stars, *(S. W. Burnham)*	P15:624
Hough double stars	P16:330
(G. W. Hough)	P16:478
Doolittle, C. L. and E., Astronomical observations of Flower obs., *(T. J. J. See)*	P14:393
Dreyer, J. L. E., Armagh catalogue of 3,300 stars	S5:283
Catalogue of nebulae, *Observaotry*	S7:175
(L. Swift)	S7:405
Tycho Brahe	S10:159
Fahie, J. J., Galileo, Life and Works, *(H. A. Howe)*	P12: 80
Fauth, P., Moon in modern astronomy	P15:450
Fisher, O., Earth *(G. F. Rodwell)*	S1:213
Flammarion, C., Copernic et Découverte du Systéme du Monde	S10:524
Planet Mars	A2: 90
Frisby, E., Yarnall catalogue of stars revised	S8:469

Volume and Page

Reviews, ***(Continued)***
- Frost, E. B., Translation of Die spectralanalyse der Gestirne, *(J. E. Keeler)* **A3**:688
- Gassendo, P., Lives of Tycho Brahe and Copernicus *(A. J. Brooks)* **P12**:569
- Giberne, A., Radiant stars **P2**:288
  - Sun, moon and stars **A2**:671
- Gibson, F. M., Amateur telescopist's handbook **P1**:431
- Glazebrook, R. F., Light, theoretical and practical *(H. Crew)* **A3**:402
- Gore, J. E., Astronomical glossary **A2**:941
  - Catalogue of suspected variable stars **S5**:160
  - Catalogue of variable stars **S8**: 41
  - Planetary and stellar studies **S7**:414
  - Scenery of the heavens **S9**:191
  - Stellar heavens **P12**:70, 360
  - Studies in astronomy **P12**:628
  - Visible universe **A2**:670
- Greene, D., Spherical and practical astronomy **S10**:478
- Gregory, R. A., Planet earth **P2**:288
- Hardy, A. S., Elements of quaternions **S1**:203
- Heath, T. E., Our stellar universe **P13**:350
- Hendrick, H. B., Catalogues of zodiacal stars, 1900-1902 **P16**:195
- Holden, E. S., Elementary astronomy **P8**:110
- Houzeau, J. C., Bibliographie generale de l' astronomie **S9**: 91
- Howe, H. A., Elements of descriptive astronomy **P5**: 56
  - Study of the sky **P4**:166
- Huggins, W. H., Arabic names of the stars **S2**: 52
- Huggins, Sir W. and Lady, Representative stellar spectra, *(W. W. Payne)* **P8**:323, 365
- Jones, G. W., Logarithmic tables **A2**:383
- Jordan, W. L., Astronomical and historical chronology *(R. W. McFarland)* **P13**:112
- Kennedy, C., Few chapters in astronomy **P2**:287
- Kirkwood, D., Asteroids, or minor planets **S7**: 95
- Klein, H. J., Star atlas **S8**:142
- Langley, S. P., New Astronomy *(F. H. Brackett)* **S7**:270
  - *(W. W. Payne)* **S7**:317
- Lewis, Struve double stars, *(S. W. Burnham)* **P14**:523
- Lockyer, J. N., Dawn of astronomy **A3**:259; **P1**:429
  - Elementary lessons in astronomy **S9**:192
  - Meteoric hypothesis **S10**: 48
- Loomis, E. Y., Eclipse party in Africa, *(M. Proctor)* **P4**:455
- Lowell, P., Solar system **P11**:464
- Lynch, E., Solar and planetary physics and motion **P16**:198
- Lynn, W. T., Celestial motions **S8**:477; **P1**:383
  - Remarkable comets **P1**:383
- Macpherson, H., Jr., Astronomers of to-day and their work **P13**:284

	Volume and Page
Reviews, *(Continued)*	
Martin, M. E., Friendly stars, *(F. E. Harpham)*	P15:384
McFarland, R. W., Era at hand	P8:486
McLennon, E., Cosmical evolution	A1:847
Century of progress in astronomy	P15: 61
Through the depths of space	P16:523
Mitchel, F. A., O. M. Mitchel *(H. A. Howe)*	S7: 95
Monck, W. H. S., Introduction to stellar astronomy	P9:359
Mouchez, Admiral, Catalogue of Paris observatory	S7: 45
Moulton, F. R., Introduction to astronomy	P14:445
Naegamvala, K. D., Total solar eclipse, 1898, India	P11:161
Nasymth (Jas.) and Carpenter (Jas.) The Moon	S5: 62
Newcomb and Holden, Astronomy	S2:228
Norton, W. A., Astronomy	S1:138
Obrecht's Catalogue *(G. O. James)*	P16:432
Oliver, J. A. W., Astronomy for amateurs	S7:127
Page, W. M., New light from old eclipses	S10:110
Parker, W. H., Familiar talks on astronomy	S9:190
Perry, Father, A. L. Cortie	S9:431
Peters, C. H. F., Catalogue of stars, *(Utica Herald)*	S6:352
Pickering, W. H., Lunar and Hawaiian physical features compared	P15: 62
Potsdam photometric Durchmusterung	P15: 59
Proctor, M., Astronomical charts	P9:165
Stories of starland	P6:368
Proctor, R. A., Old and new astronomy	S7:218, 312
completed by A. C. Ranyard, *(M. Proctor)*	A2:669
Students' atlas in 12 circular maps	S8:239
Treatise on astronomy	S6:270
Roberts, I., Collection of astronomical photographs	A3:693
Royal Obs. Belgium, Double star measures, *(S. W. Burnham)*	P13: 15
Russell, H. C., Star camera	A1:631
Safford, T. H., Catalogue of north polar stars	S8:279
Sawyer, E. F., Catalogue of southern stars, *(Salem Press)*	S5:299
Scheiner, Dr., Die spectralanalyse der Gestirne	A1:934
Schiaparelli, G., Astronomy in the Old Testament	P14:187
Science year book for 1905	P13:169
Serviss, G. P., Astronomy with an opera glass	S8:336
Other worlds	P10:112
Pleasures of the telescope, *(H. A. Howe)*	P9:286
Sharpless, I., Astronomy	S1:204
Smyth, C. P., Mean Scottish Meteorology	S8:327
Smyth, W. H., Cycle of celestial objects	S5: 95
Stebbins, J., Photometric observations of double stars	P16:257
Stroobant, P., Astronomical observations and astronomers	P15:579
Swift, L., Catalogue of nebulae	S7: 38

Volume and Page

Reviews, *(Continued)*
  Todd, D. P., New astronomy for beginners P6: 63
    Stars and telescopes, *(M. Proctor)* P7:335
  Todd, M. L., Corona and coronet days P7:279
  Upton, W., Star atlas P4:456
  von Oppolzer, E. R., Lehrbuch zur Bahnbestimmung der Kometen und Planeten S2:320
  Warren, H. W., Recreations in astronomy S2:195
  Watts, W. M., Spectrum analysis P12:687
  Webb, T. W., Celestial objects for telescopes S1:203
      common telescopes P1:384
    Sun and his phenomena S4:160
  Williams, A. S., Zenographical fragments S8:383
  Willson, R. W., Laboratory astronomy P14:317
  Winchell, A., World life *(W. W. Payne)* S2:312
  Young, C. A., Elements of astronomy S9:95; P5:447
    General astronomy .... S8:335, Cor. S8:411
      revised, *(W. W. Payne)* P6:461
    Lessons in astronomy P4:277
      including Uranography S10:383
    Manual of astronomy, *(W. W. Payne)* P10:394
    Supplement to "The Sun" P5:227, 332-4
Rhea from an eclipse, Emersion of, *C. A. Young* S10:251
Rigel and the great nebula S9:425
Right ascension circle, Automatic, *L. Swift* S8:349
Rings, Process of disintegration, *R. Hooke* A2:766
    M. W. Meyer .... A2:407, Cor. A2:765
Rittenhouse, D., *H. S. Davis* P4: 1
Rock salt for optical purposes, *J. A. Brashear* S5:149
    J. E. Keeler S5:222
    Note A3:240
Rodger, John, Death of S1: 98
Roemer, O., Historical sketch of, *T. J. J. See* P11:226, 461
Rotation of earth on its axis, Evidence of P14:183
  of Venus and Mercury, *S. C. Chandler* P4:393
    T. J. J. See P4:533
  time a function of density, *S. J. Corrigan* S8:210
Rowland's concave gratings, Astigmatism of, *J. L. Sirks* A3:763
    Asymmetry in, *J. R. Rydberg* A2:439
  diffraction gratings, Ives replicas P13:228
Rutherford photographs, *F. E. Harpham* P8:129
Sagittarii, Nova, *E. C. Pickering* P7:277, 504
ζ Sagittarii, Orbit of, *R. G. Aitken* P9: 57
    T. J. J. See A2:510
San Miguel mountain as an observatory site P13:529
Satellites, Announcing discoveries of, *W. W. Campbell* P14:135, 252

	Volume and Page
Satellites, *(Continued)*	
Announcing discoveries of, *A. C. D. Crommelin*	**P14**:147, 380
C. D. Perrine	**P14**:135, 252
Discoveries by Americans, *W. W. Payne*	**P13**:120
Ephemerides of, *J. Morrison*	**P6**:165
Measurable disks of, *T. J. J. See*	**P9**:471
Saturn, *W. W. Payne*	**S3**:101
H. C. Wilson	**S5**: 58
Drawing by H. Pratt of, *E. S. Holden*	**S3**:249
Equatorial diameter of, *F. E. Seagrave*	**P10**: 54
Five views of, *C. B. Hill*	**S7**:122
Hints to observers of, *B. J. Hopkins*	**S4**: 49
Markings and rotation period of, *W. F. Denning*	**P12**: 40
Observations of, *J. A. Brashear*	**S8**:188
J. E. Keeler	**S7**: 79
E. L. Trouvelot	**S10**:74, 119, 171
Occultation of 1900, *R. O'Halloran*	**P8**:399
M. Moye	**P8**:401
F. E. Seagrave	**P8**:407
T. D. Simonton	**P8**:404
Rotation period of, *H. C. Wilson*	**P11**:443
Spectroscopic observations of, *J. E. Keeler*	**P2**:443
Tores of, *P. Lowell*	**P16**:133, 394
Transparency of crape ring of, *E. E. Barnard*	**A1**:119
White spot on, Notes	**S8**:189, 190, 191, 236
E. E. Barnard	**P11**:408
Saturn's ring, White region of, *W. R. Brooks*	**S8**:233
rings, *G. C. Comstock*	**S10**:468
M. E. L. Trouvelot	**S4**: 78
H. C. Wilson	**A3**:260
Disappearance of, *C. Burckhalter*	**P16**:127
Ephemeris of, *J. Morrison*	**P6**:389
Galileo's work on, *E. A. Partridge* and *H. C. Whitaker*	**P3**:408
Measures of, *F. E. Seagrave*	**P11**:145; **P12**:131
Note on	**S10**: 45
Reversed curvature of shadow of, *A. Jenks*	**S9**:255
Stability of, *G. W. Coakley*	**S9**:3, 67
satellite IX, Phoebe	**P14**:640
satellites	**S2**:194; **S5**:297; **P12**:499
IX and X, *W. H. Pickering*	**P14**: 17
E. S. Holden	**S8**: 1
E. C. Pickering	**P7**:221, 233
W. H. Pickering	**A1**:649
Saturn and η *Geminorum*	**S5**:123
Uranus observations with 36-inch, *E. E. Barnard*	**A3**:557
Saturnian ball and ring system, *E. E. Barnard*	**P2**:295

Volume and Page

Saturnian, *(Continued)*
system, *D. G. Parker*......**P12**:405
Scales of seeing, *A. E. Douglass*......**P6**:193
School of practical astronomy, *E. S. Holden*......**S4**:116
Science by co-operation, *T. Lindsay*......**P4**: 84
Recent advances in, *W. Crookes*......**P7**: 3
Scientific progress during 19th C., *Knowledge Year Book*......**P9**:91, 128
Scintillation of the fixed stars, *T. J. J. See*......**P5**:463
β^1 and β^2, *Scorpii*, Occultation, 1883 of, *W. H. Numsen*......**S2**: 91
η^1 *Scorpii*, Spectroscopic binary, *E. C. Pickering*......**P4**:273
R and S *Scorpii*, *R. O'Halloran*......**P4**:275; Cor. **P4**:331
Seismic motion and other phenomena, *F. Omori*......**P14**:543
Sensitiveness in dry plates, Change of, *W. W. Campbell*......**A2**:860
G. W. Hough......**A3**:153
Sensitometry, Studies in......**P15**:319
Sextant, Adjustment of, *G. C. Comstock*......**S7**:129
J. M. Schaeberle......**S7**:223
Determining eccentricity of, *C. C. Hutchins*......**P11**:353
Shadow-bands, *E. Holmes*......**P14**:319; **P15**: 77
Shooting stars and aerolites, *W. F. Denning*......**A1**:481
Cometary, *H. A. Newton*......**A3**:196
Double, *L. Swift*......**S8**:454
Physics of, *J. F. Lanneau*......**P13**:434
Sidereal day, *J. Morrison*......**P15**: 12
heavens, Growth and magnitude of, *W. H. Lamaster*......**P3**:226
system, Center of, *J. Ennis*......**S2**:113
universe, Structure of, *T. W. Backhouse*......**S9**:337
Silvering glass mirrors, *C. H. Chandler*......**A2**: 93
A. A. Common......**A1**:852
Sirian and solar stars, *W. H. S. Monck*......**A1**: 89
Sirius, *N. M. Mann*......**S2**:136
in ancient times, *T. J. See*......**P2**:193
Color of, *W. T. Lynn*......**A1**:634
Companion to, *A. Hall*......**S3**:179
M. McNeill......**S5**:182
Orbit of......**P12**:501
T. J. J. See......**A3**: 82
History of color of, *W. H. Pickering*......Cor. **A1**:640
T. J. J. See......**A1**:269, 372, 550
Observations......**S2**:126
Orbit of, *N. M. Mann*......**P4**:482; **P7**:443
Spectrum of, *W. Huggins*......**S9**:318
System of, *N. M. Mann*......**S7**:25, Cor. **S7**: 94
Sky, Apparent figure of, *F. Schlesinger*......**P7**:117
Color of, *W. W. Payne*......**P14**: 5
at high altitudes, Blueness of, *E. E. Barnard*......**A2**:750

	Volume and Page
Sky, *(Continued)*	
from Pike's Peak	**A3**:150
travellers, Four little, *E. E. Barnard*	**P3**:143
Slough, Visit to, *D. W. Edgecomb*	**S9**: 52
Solar, See also Chromosphere, Corona, Eclipse, Prominence.	
Solar activity, 1888	**S8**:267
L. G. Léon	**P12**: 66
apex, *T. C. Ryan*	**P15**:205, 336
atmosphere, Brester's views of tranquility of, *A. Brester, Jr*	**A3**:849
Heat in the, *W. E. Wilson*	**A1**: 49
New researches on, *H. Deslandres*	**A1**:60, 314
Thermal absorption in, *E. B. Frost*	**A1**:720
constant by S. P. Langley	**S1**:271
Recent studies in, *H. J. Cox*	**P13**:147
contraction, Helmholtz's theory of, *E. Doolittle*	**P3**: 21
Corona, Mechanical theory, *J. M. Schaeberle*	**S9**:214
April, 1893, *J. M. Schaeberle*	**A2**: 7
of eclipse, Predictions of, *F. H. Bigelow*	**A2**: 97
cycle, *R. W. McFarland*	**S8**:353
Details of the recent, *R. O'Halloran*	**P12**: 27
cyclones, *R. O'Halloran*	**P7**:331
diameter, Variation of, *O. T. Sherman*	**A1**:513
disturbances, June 17, 1891, *H. H. Turner*	**A1**: 67
July 15, 1892, *G. E. Hale*	**A1**:611
H. C. Lord	**A1**:738
J. S. Townsend	**A1**:815
and terrestrial phenomena, *G. E. Hale*	**A2**:167
W. W. Payne	**P11**:374
T. S. H. Shearman	**S10**:279
W. Sidgreaves	**A1**:817
M. A. Veeder	**S10**:381
energy, Selective absorption of, *S. P. Langley*	**S2**: 59
Source and maintenance of, *J: Morrison*	**P10**:409
eruption	**S3**:185
halo and mock suns, *J. M. Boraston*	**A1**:522
heat and gravitation, *E. S. Crawley*	**S7**:325
J. K. Kedzie	**S7**:438
W. H. S. Monck	**S7**:440
hemisphere, Relative activity in, *E. B. Frost*	**S9**:109
image reflected in seas of Mars, *J. R. Holt*	**A3**:257
motion, Determination of, *M. W. Whitney*	**P12**:226, 311
Problem of, *T. H. Safford*	**A2**: 1
M. W. Whitney	**P5**:309
observations, *C. A. Bacon*	**S9**:182
D. E. Hadden,	**S10**:38; **P7**:408; **P8**:222; **P10**:254, 348; **P11**:488; **P13**:196; **P14**:603; **P15**:607.

Volume
and Page

Solar, *(Continued)*
  observations, *P. Tacchini*...A1:214, 520, 608; A2:39; A3:244, 312, 503, 588
  observatory, Mount Wilson, *G. E. Hale*..........P15:563
    W. W. Payne..........P14:312; P15:121
  parallax, *H. C. Wilson*..........A1: 95
    from observations of Eros, *S. J. Brown*..........P8:353
    Probable value of, *T. J. J. See*..........P11:460
    by spectroscopic observations of Venus, *K. Burns*..........P15:556
  phenomena, Associate, *M. A. Veeder*..........S9:279
    Distribution in latitude of, *P. Tacchini*..A1:134, 424, 711; A2:262, 425
    Photographs of, *G. E. Hale*..........A1:603
  photography at Kenwood observatory, *G. E. Hale*..........A1:407
  physics, Contributions to, *E. R. von Oppolzer*..........A2:736
    Problems of, *A. L. Cortie*..........P15:173
  prominences, *H. C. Wilson*..........S7:304
    Distribution of, (1891), *J. Evershed, Jr*..........A1:426
    Effect of light on spectrum of, *M. Fizeau*..........A1:126
    with grating spectroscope, How to see, *E. E. Read, Jr*..........S10:369
    Measurement of, *H. Crew*..........A1: 90
    Notes..........S9:182, 229, 278, 325, 374, 417; S10:39, 95, 149
      J. Fenyi..........A2: 37
      A. F. Miller..........A1:614
      W. Sidgreaves..........A1: 66
      E. L. Trouvelot..........A1:124
    photography, *J. Evershed, Jr*..........A1:827
      Results in, *G. E. Hale*..........A1: 70
    Spectrum of, *G. E. Hale*..........A1:50, 602, 618, 821
    Velocity of, *J. Fenyi*..........A1: 63
  research, Yerkes expedition for..........P12:503
  spectrum, *A. L. Cortie*..........A1:393
    Group B of..........S3:280
    Higg's map of, *G. E. Hale*..........A3:151
    Normal, *H. A. Rowland*..........S5: 85
    Rowland's maps of..........S8:140
    Scales of intensity for lines of, *L. E. Jewell*..........A2:815
    Studies on, *A. L. Cortie*..........A1:393
  spots and faculae, *W. Sidgreaves*..........A1:212
  statistics in 1892, *R. Wolf*..........A2:263
  surface, Recent studies in, *R. O'Halloran*..........P16:484
  system, Development of, *D. Kirkwood*..........A2:594
    Electric phenomena in, *J. Ennis*..........S5:234
    Goldschmidt's law applied to, *W. H. Hobbs*..........P15:345
    Magnitude of, *W. Harkness*..........A3:605
    Mechanics of..........S9:186
    Motion of, *J. G. Porter*..........A1:764
      (Potsdam observations)..........A2:563

Volume and Page

Solar, *(Continued)*
system vortices, *W. W. Payne* P16:555
and auroral coincidence, *S. P. Langley* S1: 55
Solution for *n* P6:361
Sound velocity, *S. Goodenow* S8:307, 382
Southern zones, Dr. Gould, *E. S. Holden* S1: 44
Space infinite? Is star strewn, *A. M. Clerke* P4:431
Specter of the Brocken, *J. M. Schaeberle* S10:136
Spectra,—See name of object.
of alkalies, Ultra-red in stellar, *E. C. Pickering* A2: 73
binary stars, *W. H. S. Monck* A1:326
comets *b* and *c* 1893, *W. W. Campbell* A3:571
influenced by slit-width, *H. Kayser* A3:367, 399, 505
Nature of, *H. Kayser* A3:586
copper salts, Absorption A2:846
Distribution of energy in stellar, *E. C. Pickering* A1: 22
elements, Work of Kayser and Runge, *J. S. Ames* A2:226
W. N. Hartley A1:223
Kayser and *Runge* A2:802
C. Runge A1:496; A3:128
C. A. Young P5:332
flames, *G. D. Liveing* and *J. Dewar* A1:215
at high temperature A2:647
of metallic compounds, *G. D. Liveing* and *J. Dewar* A2:434
gallium, Electric A1:520
lightning S9:295; S10:378
metallic films A1:528
metals, Infra-red, *E. P. Lewis, E. S. Ferry* A3:747
Mapping the, *H. Crew* and *R. Tatnall* A3:741
by Professor Hasselberg A3:585
new stars, *H. Ebert* P12:239
Orion nebula and stars, *W. W. Campbell* A3: 494, 695
J. E. Keeler A3:476
stars of large proper motion, *J. E. Gore* A1: 11
Milky Way, *J. E. Gore* A1:326
having peculiar, *M. Fleming* A1:27, 418, 765; A2:170, 546, 810; A3:501
E. C. Pickering P5: 52
Suitable nights for observing planetary, *W. W. Campbell* A3:860
sun and Nova *Aurigae* compared, *H. Deslandres* A1:712
metals compared photographically A1:336
sun-spots, *A. L. Cortie* A1:587
Photography of, *C. A. Young* A2:649
and chromosphere A1:613
photosphere A1:241
proper motions of stars, *W. H. S. Monck* A1:389, 700; A2:513
Spectral lines, Intensity of, *E. C. Pickering* P11:384

Volume and Page

Spectrograph, Potsdam, *E. B. Frost* **A2**:150
Spectroheliograph, *G. E. Hale* **A2**:241
of modern observatory **P13**:525
for Yerkes telescope, *G. E. Hale* **A3**: 64
Spectroscope, Adjustment of, *C. A. Young* **P5**:318
Combination of prisms for stellar, *H. F. Newall* **A3**:309
for small telescopes, *D. E. Hadden* **P3**:84, 152; **P12**:252
E. T. Whitelow **P12**:363
in astronomy, *T. Reed* **P2**:266,297, 402; **P3**:141
eclipse work, *E. W. Maunder* **P6**:376
recent chemistry, *R. A. Gregory* **P3**: 70
studying solar prominences, *W. Sidgreaves* **A1**:136
variable stars, *T. Reed* **P3**:333
of Halsted observatory, *C. A. Young* **A1**:292
Lick observatory, *J. E. Keeler* **A1**:140
Modern, *J. S. Ames* **A1**: 28
Allegheny observatory, *J. E. Keeler* **A2**: 40
Edinburgh observatory, *L. Becker* **A2**:542
Tulse Hill, *A. Huggins* **A2**:615
Use of, *E. J. Wall* **P14**:336
and some of its applications, *J. E. Keeler*—
I Principles involved in construction **P1**: 9
II Wave-length scale and solar spectrum **P1**:102
III Practical details of adjustment and use **P1**:169, 200
IV Spectra of elements **P2**: 20
Spectroscopes, Efficiency of, *J. E. Keeler* **S10**:433
Fixed-arm, *F. L. O. Wadsworth* **A3**:835
Spectroscopic binaries,—See Double Stars, Binary Stars, and Names of Stars.
η Pegasi, Orbit of **P9**:521
in *Puppis, E. C. Pickering* **P4**:390
Orbits and velocity curves of, *J. M. Barr* **P16**:259
Velocity curves of **P15**:644
determinations, *G. J. Stoney* **A1**:935
investigations at Swedish academy, *B. Hasselberg* **A1**:793
of Mr. Higgs, *G. E. Hale* **A3**:151
measurements, Interference methods applied to, *A. A. Michelson* **A1**:884
observations on Mount Blanc, M. Janssen's **A2**:845
Reduction of, *W. W. Campbell* **A1**:319
properties of dust **S10**: 9
Spectroscopy, Pending problems, *G. E. Hale* **S10**: 89
at Stonyhurst, *G. E. Hale* **A3**: 58
of sulphur, *B. Hasselberg* **A2**:347
Spectrum of the aurora, Photographic, *E. C. Pickering* **P6**:309
chromosphere, *C. A. Young* **A1**: 59
D_3 line in **A3**:585
comet *a* 1892, (Swift), *W. W. Campbell* **A1**:523, 698

Volume and Page

Spectrum of, ***(Continued)***
comet *b* 1892 (Holmes), *J. E. Keeler* **A1**:929
α Herculis, T. E. Espin **A3**:651
hydrogen, Investigations of **A1**:160; **A2**:171
Schumann's Investigations of **A2**:171, 365
lightning, *E. C. Pickering* **P10**:104
liquid oxygen, *G. B. Liveing* and *J. Dewar* **A1**:705
lines caused by change of pressure, *C. A. Young* **P5**:334
β Lyrae, J. N. Lockyer **A3**:575
E. C. Pickering **A1**:25; **A3**:584
magnesium arc **P3**:213
Mars, *W. Huggins* **A3**:771
a meteor, *E. C. Pickering* **P5**:442
nebula SD — 12°.1172 .... **A3**:159
nebulae, Wave-lengths in, *J. E. Keeler* **A2**:733
Nova *Aurigae, W. W. Campbell* **A1**:529, 799
H. Crew **A1**:231
Orion nebula, *W. W. Campbell* **A3**:695
W. Huggins **A3**:568
J. N. Lockyer **A3**:574
oxygen line, *J. S. Ames* **A3**:505
B. Hasselberg **A3**:760
stars of 1st and 2d types, *E. W. Maunder* **A1**:145
W. H. S. Monck **A1**:437
sulphur, *J. S. Ames* **A2**: 50
sun in eclipse, 1893, *T. Reed* **A1**:926
Langley's investigation of **S1**: 62
sun-spots, 1892, *H. Crew* **A1**:308
G. E. Hale **A1**:159, 310
Invisible **P3**:215
Limit of light in, *W. Huggins* **S9**: 22
New, *S. P. Langley* **P9**:415
photography, Short focus camera advantage in, *J. E. Keeler* **A3**:772, 857
Stellar, *W. de W. Abney* **A2**:273
rays, Limits of visibility of **A1**:296
Speculum, New paraboloid, *E. M. Tydeman* **P5**:559
Story of a, *A. W. Quimby* **P5**: 26
Sphere into congruent parts, Subdividing, *H. C. Goddard* **P10**:406
Spiral nebulae, Significance of, *T. J. J. See* **P14**:614
Squares of consecutive numbers, Rule for, *P. Hall* **P9**:161
Standard scale for telescopic observation, *P. Lowell* **P11**:34, 218
W. H. Pickering **P11**:113
Standard time, Progress in, **S1**:16, 41, 43, 180, 184; **S4**:88, 125; **S5**:120; **S8**:452; **S9**:57, 113, 139, 231, 331, 470; **S10**:46, 151, 157.
in U. S., Sources of, *R. G. Aitken* **P9**: 12
Standards for astronomical and physical instruments, *J. A. Brashear* **S7**: 77

Volume and Page
Standardizing photographic films, *F. H. Bigelow* **S10**:385
Star of 1572, New **S4**: 81
    A.G.C. 6886 having large power motion, *E. C. Pickering* **P13**:503
    O.Arg.S 15,292, Magnitude of, *E. C. Holden* **S1**:199
    of Bethlehem, *J. T. Ellis* **S6**:360
            J. Morrison **P11**:88, 122
            W. W. Payne **S4**:110; **S6**:265
            J. G. Porter **A2**: 6
            L. Swift **A2**:105
    A blazing, Chicago *Tribune* **S5**:269
    catalogues:
        Colored stars **A2**:925
        Common system of, *W. A. Rogers* **A2**:169, 204
        compared **S3**:246
        corrected **S6**:296
        Lalande's catalogue, *E. S. Holden* **S1**:198
        New general catalogue, *G. F. Chambers* **S9**:203
                T. H. Safford **S2**: 88
        Perth catalogue of 420 standard stars, *W. E. Cooke* **P16**:192
        Peters-Borst catalogue **S8**:138, 456
        Photographic catalogue of north polar stars, *C. E. Furness* **P9**: 1
        Southern stars (3415) **A2**:473
    clusters, *R. Sprague* **P1**:407
    colors, *J. H. Eadie* **S7**:219
    dust, *J. K. McBroom* **P11**:544
        D. E. Wing **P11**:481
    Lacaille 4955, Proper motion of, *E. S. Holden* **S1**:199
    names from Arabic, Pronunciation of, *R. H. West* **P2**:209
    New nebulous **S5**:154
    preceding *β Capricorni* **S3**:120-1
    Relation between color and age of a, *W. M. Pearson* **S9**:297
    shower, Approaching, *L. Swift* **P7**:415
    studies with opera-glass, *W. W. Payne* **S3**: 51
    systems, Life history of, *H. L. Clarke* **P3**:489
    temperature, Magnesium spectrum an index of, *J. E. Keeler* **A3**:660
    Yarnall, 3106, Observations of, *E. S. Holden* **S1**:169
Star's image in field of a parabolic reflecting telescope, *J. M. Schaeberle* . . **P6**: 33
    position, from photograph, To obtain, *C. D. Perrine* **P15**:259
Stars—See also Binaries, Double Stars, Spectroscopic Binaries, Variables, and star Names.
    Age of the, *M. Janssen* **S7**:202
            T. J. J. See **P6**:361
            H. C. Wilson **S7**:173
    Among the, *E. S. Holden* **P8**:531
    with annual motion of 1" and over, *J. G. Porter* **P8**:382
    in *Coma Berenices, W. C. Kretz* **P9**: 75

	Volume and Page
Stars, *(Continued)*	
Constitution of the, *E. C. Pickering*	A2:718
Distances of the, *D. Gill*	S3:216
W. W. Payne	P1:129
fixed, *J. M. Schaeberle*	P15:412
Note on	S1:161; P15:517, 583
Distribution of the, *A. M. Clerke*	A2:515
H. Macpherson, Jr	P15:400
W. H. S. Monck, S4:56; S7:20, 73, 105, 236; S10: 409, 453.	
Doppler's principle of distances of the	A2:472
Explosion of, *A. W. Bickerton*	P12:666
Evenings with, *M. Proctor*	P4:321, 374, 436, 515, 562
Fixed, *W. H. S. Monck*, P1:195, 300, 385; P2:60, 108; P3:62; P4: 259; P5:467.	
Images of, *A. Hall*	S5: 97
with large proper motions, *J. G. Porter*	S4:188
in line of sight, Motion of	P14:316
Missing, + 4°3555	P5:218
+ 7°5106	P5:220
+ 46°3019	P5:219
BD + 17°344	P13:275
BD + 37°855	P13:275
near north pole, *W. W. Payne*	P12:265
Pleiades, Number and distribution of, *H. C. Wilson*	P15:193
Nearer to the, *E. E. Barnard*	P2:245
in northern hemisphere, *H. Seeliger*	S4: 33
Number of the, *G. J. Burns*	P12:267
W. Gibson	P14:594
Occultations of, by dark limb of moon	S6:162
with an opera-glass, *G. P. Serviss*	S10:244
Parallax of the, *W. H. S. Monck*	S8: 62
Parallaxes of southern, *E. S. Holden*	S1:133
that periodically glow and fade, *R. O'Halloran*	P11:294
Photographs of faint, *E. C. Pickering*	P15:171
Proper motion of, *W. H. S. Monck*	A1:253
Relative brightness of	P13:283
Schaeberle on distances of fixed	P15:583
Searching for new, *T. D. Anderson*	P10:246
Shooting, *W. F. Denning*	
1. General remarks	P1: 34
2. Preliminaries of observation	P1: 67
3. Radiation and radiant points	P1: 97
4. Observation of meteors	P1:147
5. Radiation and duration of meteor showers	P1:208
The August Perseids	P1:267; Cor. P1:333

Volume and Page

Stars, *(Continued)*
  Shooting, showers of Leonids **P1**:296
      Andromedes of Biela's comet **P1**:345
      Fireballs **P1**:438
  Size of, *W. W. Payne* **P14**:164
  Southern zone **S3**:153
  Sparsity of the, *J. F. Lanneau* **P15**:390
  Spectra and proper motions of, *W. H. S. Monck* **A2**:811
  Systematic motions of the **P15**:122
  Temporary, *H. M. Parkhurst* **S6**:118
  Time, *E. S. Holden* **S1**:124
  Variability of red, *E. S. Holden* **S1**:134
  visible at Lowell observatory, Chart of, *P. Lowell* **P13**:391
  and the galaxy, Systematic, *W. H. S. Monck* **P14**:419
      Milky Way, *M. E. Byrd* **P6**:288
    planet finder, Barrett-Serviss' **P14**:444
Star-correction machine, *D. T. Wilson* **P10**: 82
Star-ratio, Significance of, *G. C. Comstock* **P15**:131
Star-streaming by A. R. Hinks **P14**:315
Starlight, Brightness of, J. E. Gore **P9**:506; **P10**:227
  Shadows cast by, *H. N. Russell* **P10**:242
Starry heavens, Extent of, *W. W. Payne* **P11**:411
Stellae novae, *H. S. Davis* **P9**:284
Stellar astronomy, Aims of, *T. J. J. See* **P5**:194
  bands in zodiac from *Gemini* to *Scorpio, A. E. Douglass* **P5**:511
  characters, Correlation of **P16**:392
  evolution, Dunér and Scheiner, *Vierteljahrschrift* **P6**: 85
  floor, *E. L. Larkin* **P10**:252
  magnitudes by photographs, *E. S. Holden* **S9**: 12
    Standards of, Committee report **S4**:20, 43
      E. C. Pickering **S4**:24; **P15**:303
  motion, Mean speed of **P11**:222
    and velocity of wave propagation, *L. d' Auria* **P11**:254
      nature of ether, *L. d' Auria* **P11**:254
  motions, Photographic determination of, *E. C. Pickering* **A3**:521
  parallax, *C. W. Pritchard* **S8**: 93
  parallaxes, Table of, *H. Sadler* **S9**:342
  photography, *M. Wolf* **A2**:622
      E. E. Barnard **S6**: 58
      criticized, Harvard plans for **S8**:377
  photometer **A2**:563
  photometry, *H. M. Parkhurst* **A3**:652
      C. M. Smith **P5**:117
      Note on **A2**:646
  places determined by photographic method, *F. H. Bigelow* **A1**: 42
  rotation, Spectroscopic determination of, *J. R. Holt* **A2**:646

Volume and Page

- Stellar, *(Continued)*
  - scintillation, Theory of, *Lord Rayleigh* **A2**:834, 921
  - spectra, Notes on **A3**:158
    - Lockyer's researches on, *J. E. Keeler* **A3**: 59
    - studied photographically **S6**:222; **S8**:228
  - systems, Absolute dimensions of, *H. C. Wilson* **P3**:216
    - origin of, *T. J. J. See* **S10**:179
    - Researches in evolution of, *S. W. Burnham* **P4**:471
  - types, Distribution of, *J. M. Boraston* **A2**: 57
- Stereoscope applied to astronomical researches, *G. Van Biesbroeck* **P12**:318
- Stone, Ormond, *F. P. Matz* **P8**:452
- Strassburg observatory of royal university, *H. C. Wilson* **P5**:171
- Struve double stars, Observations of, *W. J. Hussey* **P7**:153
- Struve's testing of his Clark objective **S2**:124
- Sun **S1**: 15
  - Apparent size of, *C. H. Chandler* **P7**:342
  - Constitution of **S1**: 9
    - *W. Sidgreaves* **A2**:826
    - *C. A. Young* **P12**:221
  - Distance and constitution of, *W. W. Payne* **S7**:100
  - Effective temperature of, *W. E. Wilson* and *P. L. Gray* **A3**:382
  - in high altitudes, Study of **S1**:193
  - Is there oxygen in atmosphere of? *N. C. Dunér* **A3**:215
  - January, 1904, *L. G. Léon* **P12**:284
  - as a magnetized sphere, *F. H. Bigelow* **P14**:37, 463
  - observations at Syracuse university, *E. D. Roe, Jr* **P16**:127
  - Photograph of, *H. C. Wilson* **P8**: 94
  - Photographic study of, *G. E. Hale* **A1**:811
  - Photographing, *W. W. Payne* **P2**:116
    - flocculi of **P14**:311
  - Photography and figure of the, *W. W. Payne* **P13**:475
  - Present knowledge of, *W. W. Payne* **P12**:293
    - measurements of distance of **P15**:385
  - Spectroscopic observations for parallax of, *Observatory* **P11**:219
  - Stellar magnitude of, *W. Ceraski* **P14**:226
  - Studying corona of, *H. H. Turner* **P14**:548
  - Temperature of, *H. LeChatelier* **A1**:517
  - Theory of, *A. Brester, Jr* **A2**:914; **A3**:218
    - *J. Janssen* **A3**:238
  - Transit circle observations **S8**:470
  - a variable star **P14**:447
- "Sun," Supplemental notes to Professor C. A. Young **P5**:277, 332
- Sun's atmosphere, Brester's views on, *E. von Oppolzer* **A3**:581
  - chromosphere, *S. J. Perry* **S4**: 51
  - distance from observing Eros, *W. W. Campbell* **P9**: 88
    - *H. C. Wilson* **P12**:149

and Page
Volume

Sun's, *(Continued)*
Corona, Electro-magnetic theory of, *H. Ebert* A2:804
M. I. Puppin A2:928
Diameter, Variation of A3:183
Effect on terrestrial magnetism, *Lord Kelvin* A2: 74
equatorial acceleration, *E. J. Wilczynski* P6:209
C. A. Young P5:335
heat, *W. H. S. Monck* A3:823
A. S. Young P6:145
Source of, *J. F. Lanneau* P14:410
and radium, *R. J. Strutt* P12: 75
motion referred to group of fainter stars, *G. C. Comstock* P12:112; P15:190
in space and fixed stars, *W. H. S. Monck* .... P16:239.
photosphere, Nature of A2:926
rotation determined by faculae, *A. Belopolsky* A2:632, 637
Dr. Wilsing A2:635
surface (1892) and terrestrial magnetism, *G. E. Hale* A1:917
W. W. Payne S7:225
Sun and his system, *N. Lockyer* P9:123
moon, First observations of, *M. E. Byrd* P1:216, 252
near horizon, Apparent enlargement of, *T. J. J. See* P8:362
Nova *Aurigae* compared spectroscopically, *H. Deslandres* A1:712
stars in space, *W. S. Monck* P10:307
Venus, Diameters of, *H. C. Wilson* A1: 95
Sun-dials and Ahaz, *H. S. Davis* P7:102
J. H. Earp P7:167
B. S. Easton P7:242, 277
R. M. McCreary P7:167
R. R. McLeod P7:108
J. Morrison P6:537; P7:102-3, 368
S. A. Saunders P7:206, 444
L. Swift P7:51, 167; P10:278
Sun-spot, Area and position of great A1:335
cycles compared with Scottish meteorology, *C. P. Smyth* S8:385
maximum, *J. F. Lanneau* P12: 67
of 1905, *R. O'Halloran* P14:368
mimimum, *R. O'Halloran* P6:479
observations: *E. Brown,* A1:925, A2:74; *E. B. Frost,* S9:183; *D. E. Hadden,* P11:560; *R. O'Halloran,* P4:570, P7:278, P9:412, P11:579; *H. C. Wilson,* A1:248, P2:49.
at Goodsell observatory, S9:230, 280, 325, 418, 468; S10:37, 102, 150; A3:293.
Meudon observatory, by M. J. Janssen A1:334
Mount Holyoke observatory, S10:37; 1900-01, P10:167; 1902-3, P12:214; 1904, P13:168; 1905, P14:111; 1906, P15:127; 1907, P16:188.

	Volume and Page
Sun-spot observations at, *(Continued)*	
Smith observatory	**S9**:137, 182, 230, 278, 375, 417, 467; **S10**:36, 103
in 1885, *R. H. Ferguson*	**S4**:238, 261
1891, *A. L. Cortie*	**A1**:130
J. Fenyi	**A1**:430
1903, *J. F. Lanneau*	**P11**:372
L. G. Léon	**P12**:216
1905, *Th. Moreux*	**P13**:168, 194
1907, *E. D. Roe, Jr.*	**P15**:447
periods, Maxima and minima of, *S. Hirayama*	**P15**:188
positions measured by Stonyhurst disks, *A. L. Cortie*	**P16**:426
Recent cyclonic, *R. O'Halloran*	**P7**:278
spectra	**A1**:162
photographed	**A2**:171
variation in latitude, *E. W. Maunder*	**P12**:616
zones, Spoerer's law of	**P11**:407
and its influence	**A1**:527
Sun-spots, Cyclone theory of, *F. H. Collins*	**A1**:826
Formation of, *J. R. Hooper*	**S7**:397
Level of, *W. M. Mitchell*	**P13**:392
note	**P15**:187
in line of sight, Motion of vapors in	**P15**:319
Mechanical causes of, *J. M. Schaeberle*	**A3**:278
Naked eye, *W. E. Wilson*	**S8**:322
Notes on, *R. E. Bruce*	**P13**: 82
Number of, *W. Dawson*	**S3**:171
Origin of, *E. von Oppolzer*	**A2**:419
numbers of, Revision of Wolf's, *A. Wolfer*	**P10**:449
Thermal radiation from, *W. E. Wilson*	**A3**:378
as vortex rings, *F. H. Bigelow*	**S6**:139
and aurorae, Periodicity common to	**A1**:526
Relation between, *M. A. Veeder*	**A1**:434
magnetic storms	**A1**:316, 499, 527
F. H. Hesse	**A1**:615
A. Ricco	**A2**: 33
their theories, *W. T. Lynn*	**P14**: 90
Sunrise phenomenon, *L. G. Léon*	**P10**:557
Sunset at sea, *E. D. Roe, Jr*	**P14**:444
glow, *J. R. Hooper*	**S4**:178
Sunsets, Red, *W. W. Payne*	**S2**:293
Superstructure, *M. B. Cutler*	**S5**:267
Surface markings of celestial objects, Methods of delineating, *F. L. O. Wadsworth*	**P5**:200
Swasey, Ambrose, *J. A. Brashear*	**P7**:345
Swift's, Lewis, medals, Description of, *L. Swift*	**P9**:505
and honors, *W. W. Payne*	**P5**: 96

Volume and Page

- Symbols, Uniformity of mathematical, *A. E. Haynes*....**P8**: 56
- Syrtis Major, Markings in, *P. Lowell*....**P4**:289
- System of — *Cancri, S. W. Burnham*....**A2**:872
- Systems of Galileo, Ptolemaic and Copernican, *C. C. Hutchins*....**P12**:442
- Tablets of Nippur, Mathematical, *D. E. Smith*....**P15**:366
- Tangent index, *J. Haywood*....**S5**:270
- α *Tauri,* Occultations of....**S6**:45, 194
- α *Tauri, J. G. Porter*....**S4**:187
- ξ *Tauri, T. C. H. Bouton*....**P16**:254
- *Taurus,* Convergent of moving cluster in, *L. Boss*....**P16**:566
- Telescope aids ordinary vision, How the, *W. W. Payne*....**P3**: 81
  - Bruce photographic, *E. C. Pickering*....**S8**:304; **P4**:531
  - Buildings, Balance roof of, *A. E. Douglass*....**A2**:207, 400
    - *C. A. Post*....**P2**: 88
  - Care of the, *F. M. Gibson*....**P2**:412
    - *W. W. Payne*....**P13**:506
  - Clock-work of, ...**S7**:259
  - Efficiency of a small, *G. C. Comstock*....**S10**:406
  - Equatorial, *H. M. Parkhurst*....**S7**: 38
  - Five-inch, *G. P. Serviss*....**P1**:372
  - for Amherst, Large refracting, *W. W. Payne*....**P11**: 22
    - eclipse observations, Mounting for, *F. H. Bigelow*....**A1**:257
    - Goodsell observatory, Williams equatorial....**S10**:354
    - Greenwich observatory **A3**:317
    - Halsted observatory, *C. A. Young*....**S1**:131
    - Harvard, Mounting the 60-inch, Chicago *Record-Herald*....**P14**:142
      - *E. C. Pickering*....**P13**:70, 106
    - Lehigh university **S1**: 71
    - Lick observatory, 36-inch, *E. S. Holden*....**S7**:296
      - *Nature* **S1**: 99
      - *W. W. Payne*....**S9**: 97
    - Potsdam, Photographic **A3**: 81
    - E. L. Schafer....**S1**: 71
    - Lewis Swift **S1**:268
    - Yerkes **S9**:422
    - in high schools, Small, *W. W. Payne*....**P11**:429, 491; **P12**:546, 608
  - Hints for small, *F. E. Harpham*....**P2**:106
  - History of the *C. S. Hastings*....**S10**:335
  - International southern, ...**P14**:639
  - Invention of, *D. W. Edgecomb*....**P7**:184
  - Large southern, *E. C. Pickering*....**A1**:783
  - lenses, Construction of, *C. Faulhaber*....**P13**:534
  - mirror, Polishing and grinding, *G. S. Jones*....**S9**:353
  - mountings and domes, *W. H. Pickering*....**A3**: 1
  - New form of, *E. M. Tydeman*....**P8**:464
  - Observations with a small, *C. W. Carlisle*....**P12**:328

	Volume and Page
Telescope, *(Continued)*	
song, Herschellian, *E. S. Holden*	**S3**: 85
with spectroscope small, *D. E. Hadden*	**P1**:478
Three-inch, *W. Strong*	**P13**:203
Twenty-four inch, *E. C. Pickering*	**P13**:224
Vogel's opinion of Vienna	**S4**: 29
Telescopes, American, *D. Todd*	**S7**:412
Future, *A. G. Clark*	**A2**:189, 673
Good astronomical, *H. Grubb*	**S7**:106
Long focus, *W. Rollins*	**A3**:199
Methods of defining, delineating and resolving the power of, *F. L. O. Wadsworth*	**P5**:528
pay? Do large	**A1**:927
Possibilities of, *A. G. Clark*	**A2**:319
Problems in constructing large, *W. R. Warner*	**A2**:695
of short focal length, *H. L. Smith*	**S1**:239; **S7**:293, 360
Small vs. large, *S. W. Burnham*	**S4**:193
W. F. Denning	**S4**:259
F. P. Leavenworth	**S9**: 47
C. A. Young	**S5**: 1
Note on	**A3**:241
Two large, *A. A. Common*	**A2**: 11
in United States, *Congressional Record*	**P8**:292
W. H. Knight	**S10**:393, 475
Work for large, *E. C. Pickering*	**A2**:114
of world, Large, *W. W. Payne*	**S3**:193
and other optical instruments, *W. B. Musson*	**P8**:378
Telescopic illumination, *O. Stone*	**S6**: 73
Tempel's second periodic comet, (*c* 1899) *C. D. Perrine*	**P7**:291
Temperature for gaseous celestial bodies, Law of, *T. J. J. See*	**P7**:129
C. A. Young	**P7**:225
of sun and stars, Surface, *J. Scheiner*	**A3**:569
Temperatures of Mars, Venus and Mercury, *S. J. Corrigan*	**P16**:258
Teneriffe, Alta Vista, Teyde, *D. W. Edgecomb*	**S9**:392
Terrestrial magnetism, Solar origin of, See Magnetic disturbance.	
Terrestrial magnetism, *H. Harvey*	**P9**:467
during solar eclipse	**P16**:196
Test objects for small telescopes	**A3**:168
of photographic plates, Standard	**P16**:261
Thales, Eclipse of, *W. H. S. Monck*	**P10**:127
J. N. Stockwell	**P9**:376
Thermodynamics of the atmosphere	**P15**:316
Thoth and the Amenthes, *P. Lowell*	**P13**:251
Three bodies, Problem of, *F. R. Moulton*	**P5**:407
Tidal friction and planetary rotations, *I. E. Christian*	**P9**:194
wave on terrestrial spheroid, Propagation of, *T. J. J. See*	**P8**:373

Volume and Page

Tides, Origin of, *A. K. Bartlett* ······ **P11**:494
Time, *F. R. Moulton* ······ **P12**:391
  J. G. Porter ······ **S6**: 95
  Geological, *W. Upham* ······ **P14**:264
  latitude, azimuth for field work, Obtaining, *W. E. Cooke* ······ **P11**:169
  observations with small transit ······ **S3**:209
  obtained with engineer's transit, *G. O. James* ······ **P15**:475
      F. H. Seares ······ **P13**:553
    from single altitudes, *S. D. Townley* ······ **P14**:148
    with surveyor's transit, *G. O. James* ······ **P13**:499
  Origin of standard ······ **P14**:638
  Solar and sidereal, *A. K. Bartlett* ······ **P12**:649
  stars for amateurs, *E. Iliff* and *L. Waterbury* ······ **P2**: 74
  Transmission of, *O. Klotz* ······ **P15**:129
  True unit of ······ **S3**:122
  service at Cape Good Hope ······ **P13**:576
    Dominion observatory, Canada ······ **P15**:321
    Goodsell observatory ······ **S1**: 16
    Harvard observatory ······ **A1**:345
    Lick observatory, *J. E. Keeler* ······ **S6**:233
    United States Naval observatory ······ **S9**: 57
    Washburn observatory, *S. D. Townley* ······ **S1**:24; **A1**:467
  signal from United States Naval observatory ······ **P10**:447; **P13**:110, 143
      W. W. Payne ······ **P12**:613, 684
  and azimuth, New method of obtaining ······ **S6**:224
    latitude determined from equal altitudes, *G. C. Comstock* ······ **P11**:238
    time signals, *C. R. Willard* ······ **P1**: 60
Transit circle, Effect of temperature upon constants of, *H. R. Morgan* ······ **P14**:452
    observations, 1875-1883, Washington ······ **S8**:470
  factor tables, Computing, *H. S. Davis* ······ **P10**:303
  Hanging level attached to portable, *T. H. Safford* ······ **S9**:433
  instrument, Automatic, *F. H. Bigelow* ······ **S7**:205
  instruments, Flexure of the axis, *C. A. Young* ······ **S2**:101
  observations for time, Reducing, *C. B. Hill* ······ **A2**:212
    by photography, *W. P. Gerrish* ······ **S9**:111
  pivots at Washburn, Inequality of, *A. J. Sanborn* ······ **S2**:225
Transiting stars, New method of, *M. B. Snyder* ······ **P10**:350
Transits of inferior planets, *J. R. Eastman* ······ **S2**:182
  of Venus and Mercury, *J. Morrison* ······ **P5**:536
    Method of calculating, *M. Updegraff* ······ **S10**:225
Triad of stars, *E. W. Maunder* ······ **P16**:403
Triangulation of the circumpolar region, Heliometer ······ **P12**:429
Trifid nebula, M 8, Photographs of, *E. E. Barnard* ······ **A3**:791
Tucker, R. H., the head of Southern observatory ······ **P16**:327
Twilight, *O. E. Harmon* ······ **P4**:148, 211, 252; **P5**:257
Ultra-violet rays of spectrum ······ **A1**:825

	Volume and Page
Ultra-violet rays, *(Continued)*	
Photographing	**A1**:829
Universe, On an infinite, *O. Ely*	**P16**:435
G. W. Hough	**P16**:461
W. H. S. Monck	**P16**:596
limited and spherical in form? Is the	**P12**: 69
Man's place in the	**P11**:223
United States Coast Survey office	**A3**:414
Naval observatory, *W. W. Payne,* **A3**:601, 707; **P2**:91; **P5**: 166, 223, 224, 330, 501; **P7**:365, 459, 500; **P9**:71, 166, 216, 350, 563; **P10**:14, 387; **P11**:57, 276, 520.	
Time service of, (See Time Signal from U. S. N. ob.)	
Uranus, Discovery of, *H. P. Tuttle*	**S8**: 34
Figure of	**S3**:315
Note	**S2**:254
Occultation of, *F. E. Seagrave*	**A1**:540
Satellites of, *H. Harrison*	**S8**:275
Note on	**S8**:231
Spectrum of	**S8**:329
Tables of	**P7**:502
and Saturn, Photographic spectra of, *Mr. and Mrs. Huggins*	**S8**:450
ζ *Ursae Majoris* Spectrum of, *E. C. Pickering*	**S9**: 80
φ *Ursae Majoris,* Orbit of	**P11**:576
β *Ursae Minoris,* Suspected variable	**S1**:130
Π^2 *Ursae Minoris* (Σ 1989) *S. W. Burnham*	**A1**:548
Ursids, See Meteors.	
Vacant regions of the sky, *E. E. Barnard*	**P14**:579
Vacation notes, *T. J. J. See*	**P6**:360
Vacuum-spectrograph, *Herr Schumann's*	**A1**:237
Variability and the asteroids, *G. A. Thompson*	**P13**:378
Variable star atlas in preparation, *J. G. Hagen*	**P5**:20; **P7**: 85
P. S. Yendell	**P14**:298
catalogue, Preparations for new, *G. Müller*	**P11**:138
clusters, *E. C. Pickering*	**P3**:197; **P5**:276; **P6**:505
New, *E. C. Pickering*	**A1**:752
kind of, *J. A. Parkhurst*	**P3**:214
phenomena, Chandler on	**S8**:277
Suspected, BD + 37°811 *Persei*	**P15**:313
Variable stars, *J. M. Barr*	**P15**:217
W. J. Gill, Jr	**P4**:434
J. A. Parkhurst, **P1**:125, 161, 212, 263, 315, 358, 397, 460; **P2**:18, 95.	
W. W. Payne	**S8**:247
P. S. Yendell, **P3**:446; **P4**:13, 536; **P5**:16, 84, 172, 235, 302, 399; **P12**:32.	
of *Algol* type, *W. H. S. Monck*	**P5**:559

Volume and Page

Variable stars, ***(Continued)***
of *Algol* type, *E. C. Pickering*.................**P8**:162; **P10**:157
H. C. Wilson.........................**P8**:113
Minima of............**A1**:84, 165, 247, 340, 440, 534, 624, 743, 834, 939; **A2**:82, 179, 275, 368, 467, 567, 657, 754, 853, 933; **A3**:79, 167, 253, 322, 409, 510, 592, 703, 778; **P1**:41, 88, 142, 236, 280, 332, 379, 420, 468; **P2**:36, 84, 137; **P3**:36, 149, 208, 326, 375, 430; **P4**:103, 158, 217, 270, 330, 384, 447, 527, 572; **P5**:48, 109, 162, 217, 270, 325, 388, 437, 497, 554; **P6**:52, 116, 182, 246, 302, 353, 412, 472, 531, 581; **P7**:41, 93, 161, 214, 265, 319, 378 435, 492, 535; **P8**:44, 100, 157, 213, 286, 343, 395, 458, 515; **P9**:104, 460, 516, 572; **P10**:46, 101, 156, 213, 269, 327, 383, 440, 495, 544; **P11**:48, 97, 156, 209, 269, 334, 402, 454, 507, 569; **P12**:59, 138, 206, 275, 353, 417, 491, 563, 622, 676; **P13**:50, 101, 160, 216, 277, 344, 405, 465, 521, 570; **P14**:59, 116, 177, 245, 309, 375, 436, 499, 567, 632; **P15**:55, 117, 180, 249, 308, 374, 438, 509, 573, 638; **P16**:58, 116, 183, 249, 316, 381, 446, 511, 581, 646.
Approximate magnitudes of, **P11**:99, 213, 271, 339, 403, 457, 510, 572; **P12**:61, 141, 209, 278, 356, 421, 495, 562, 623, 674; **P13**:48, 103, 163, 215, 276, 345, 407, 464, 519, 569; **P14**:61, 115, 175, 244, 307, 377, 434, 498, 569, 635; **P15**:52, 115, 182, 251, 310, 376, 436, 506, 575, 635; **P16**:114, 186, 252, 319, 385, 450, 514, 584, 649.
Comparison stars for, *E. C. Pickering*.............................**P6**:125
long period **P1**:282
Co-operation in observing, *E. C. Pickering*........................**P9**:148
Density of *Algol*.....................................**P8**:105; **P16**:454
with different notation, *H. C. Wilson*............................**P10**:312
discovered in 1907, *W. E. Sperra*..............................**P16**:488
Discoveries of, *G. A. Thompson*...............................**P13**:445
Distribution of type IV of.......................................**P7**:536
Durchmusterung of, *E. C. Pickering*............................**P14**:508
Ephemeris of **S1**:104
Gore's revised catalogue of......................................**S8**: 41
Harvard circular lists of new, No. 6, **P3**:481; No. 7, **P4**:48; No. 10, **P4**:224; No. 12, **P14**:446; No. 24, **P6**:55; No. 34, **P6**:530; No. 47, **P8**:162; No. 79, **P12**:566; No. 90, **P13**:218; No. 91, **P13**:221; **P14**:160; No. 122, **P15**:56; No. 124, **P15**:185; No. 132, **P16**:55;

Volume and Page

Harvard circular, *(Continued)*
No. 133, **P16**:56.
map list, *E. C. Pickering* **P15**:617
Light curves:
RS *Aquarii,* (— 1898) **P15**:185
U *Aquilae,* (— 1886) **P14**:432
η *Aquilae,* (— 1784) **P11**:573
X *Aurigae,* (8.1900) **P12**:211
Y *Aurigae,* (71.1901) **P13**:275
R *Camelopardalis* (— 1858) **P6**: 54
RV *Capricornae* (108.1905) **P14**: 58
RY *Cassiopeiae,* (28.1906) **P15**:380
U *Cephei* (— 1880) **P10**:159
SU *Cygni* (— 1897) **P15**:119
UY *Cygni* (1.1902) **P15**:640
VW *Cygni* (55.1903) **P14**:249
VX *Cygni* (58.1903) **P13**:340
VY *Cygni* (61.1903) **P15**:572
VZ *Cygni* (7.1904) **P14**:497
XZ *Cygni* (76.1905) **P14**:433
ZZ *Cygni* (193.1906) **P15**:254
RW *Draconis* (87.1906) **P15**:511
RX *Herculis* (— 1898) **P10**:159; **P13**:410
V *Lacertae* (110.1904) **P16**:123
β *Lyrae* (—1784) **P11**:399; **P13**:275
Y *Lyrae* (12.1900) **P10**:215
RV *Lyrae* (13.1902) **P14**:250
Messier cluster, 33 of 5 .... **P7**:495
U *Ophiuchi* (1871) **P11**:573
RY *Persei* (120.1906) **P15**:380
RV *Tauri* (45.1905) **P16**:387
W *Ursae Majoris* (3.1903) **P11**:215
X *Vulpeculae* (161.1904) **P15**:511
Missing, RR *Cygni* **P11**:216
Long period, *J. A. Parkhurst* **P2**:215, 316, 415
Maxima and minima of long period, **P1**:419, 469; **P2**:37, 83, 136; **P3**:37; **P4**:104, 158, 216, 270, 330, 383, 447, 526, 571; **P5**:48, 109, 164, 218, 269, 326, 555; **P6**:53, 116, 183, 246, 303, 353, 412, 472; **P7**:92, 161, 215, 264, 320, 377, 435; **P8**:98, 156, 212, 286, 342, 394, 458; **P9**:517, 572; **P10**:47, 102, 157, 214, 270, 330, 384, 441, 496; **P11**:49, 98, 159, 213, 272, 338, 405, 456, 509.
Maxima of short period, not *Algol* type, **P9**:517; **P10**:157, 214, 270, 328, 384, 441, 496, 545; **P11**:99, 158, 211, 270, 336, 404, 455, 508, 570; **P12**:60, 140, 208, 277, 355, 419, 493, 564, 624, 675; **P13**:49, 104, 162, 214, 278, 341, 408, 467, 520, 568; **P14**:60, 118, 178, 247, 310, 376, 437, 501, 568, 634; **P15**:54, 114, 183, 252, 311, 378, 440,

Volume and Page

Variable stars, Maxima of short period, not of *Algol* type, *(Continued)*
507, 572, 637; **P16**:60, 118, 185, 250, 318, 383, 448, 513, 583, 648.
Naming recently discovered **P10**:442; **P12**:62; **P14**:179
in nebula **P10**:494
New (Elements)
W *Andromedae* (1899) **P7**:162, 215
X *Andromedae* (3.1900) **P13**:514
RR *Andromedae* (69.1901) **P13**:514
RS *Andromedae* (— 1898) **P12**: 63
RU *Andromedae* (11.1903) **P11**:274, 340; **P12**: 62
— *Andromedae* (62.1903) **P12**:142
RV *Andromedae* (17.1904) **P12**:423
RW *Andromedae* (189.1904) **P13**:157; **P14**:179
RX *Andromedae* (38.1905) **P13**:274; **P14**:179
RY *Andromedae* (44.1905) **P13**:338; **P14**:180
RZ *Andromedae* (166.1904) **P13**:52; **P14**:637
SS *Andromedae* (167.1904) **P13**:52; **P14**:637
ST *Andromedae* (52.1906) **P16**:121
SU *Andromedae* (53.1906) **P16**:121
SV *Andromedae* (1.1907) **P15**:255; **P16**:121
SW *Andromedae* (5.1907) **P16**:120
SX *Andromedae* (51.1907) **P15**:443; **P16**:120
SY *Andromedae* (136.1907) **P15**:571; **P16**:54, 182, 247
SZ *Andromedae* (141.1907) **P16**: 55
TT *Andromedae* (143.1907) **P16**:55, 247
RS *Aquarii* (1898) **P7**:320
RV *Aquarii* (48.1907) **P15**:442; **P16**:121
— *Aquarii* (163.1907) **P16**: 56
Y *Aquilae* **P6**:418
RT *Aquilae* (1897) **P5**:556; **P13**:514
RU *Aquilae* (1898) **P6**:532; **P7**:265
RX *Aquilae* (71.1903) **P12**:210
RY *Aquilae* (77.1903) **P12**:210
RZ *Aquilae* (83.1903) **P12**:210
SS *Aquilae* (64.1903) **P14**:180
ST *Aquilae* (78.1903) **P14**:180
SU *Aquilae* (33.1905) **P14**:180
(64.—85.1903) **P12**:210
SV *Aquilae* (68.1903) **P14**:637
SW *Aquilae* (79.1903) **P14**:637
SX *Aquilae* (80.1903) **P14**:637
Aquilae (2.—37.1905) near δ **P13**:273
Aquilae (48.—57.1905) **P13**:411
SY *Aquilae* (48.1906) **P14**:637
Aquilae (80.—85.1906) **P14**:496
SZ *Aquilae* (63.1907) **P15**:443; **P16**:121

Variable stars, New, *(Continued)*

	Volume and Page
TT *Aquilae* (64.1907)	**P15**:443; **P16**:121
Nova *Aquilae* (104.1905)	**P13**:513
Aquilae, 25 new in	**P12**:565
Aquilae, 76 new in	**P12**:566
— *Arietis* (116.1905)	**P14**:119
— *Arietis* (147.1907)	**P16**: 55
W *Aurigae* (1898)	**P7**:43, 215; **P8**:515
Z *Aurigae* (1.1903)	**P11**:214; **P12**:62; **P13**:514
RS *Aurigae* (157.1904)	**P12**:677
RT *Aurigae* (47.1905)	**P13**:339; **P14**:179
RU *Aurigae* (62.1905)	**P13**:411; **P14**:179
RV *Aurigae* (21.1904)	**P14**:637
RW *Aurigae* (27.1906)	**P14**:304, 637
RX *Aurigae* (33.1906)	**P14**:374, 637; **P15**:184
RY *Aurigae* (27.1907)	**P15**:381; **P16**:120, 247, 248
RZ *Aurigae* (29.1907)	**P15**:441; **P16**:580
SS *Aurigae* (31.1907)	**P15**:441; **P16**:246, 387, 509, 580, 652
ST *Aurigae* (32.1907)	**P15**:441
SV *Aurigae* (180.1907)	**P16**:123
SW *Aurigae* (181.1907)	**P16**:123
SX *Aurigae* (79.1907)	**P16**:321
SY *Aurigae* (80.1907)	**P16**:321
— *Aurigae* (30.1907)	**P15**:441
— *Aurigae* (78.1907)	**P16**:580
— *Aurigae* (148.1907)	**P16**: 55
— *Aurigae* (3.1908)	**P16**:247
— *Aurigae* (4.1908)	**P16**:247
— *Aurigae* (44.1908)	**P16**:652
— *Aurigae* (45.1908)	**P16**:652
— *Aurigae* (49.1908)	**P16**:652
RR *Boötis* (86.1906)	**P14**:497; **P16**:120
RS *Boötis* (14.1907)	**P15**:185; **P16**:120
RT *Boötis* (67.1907)	**P16**:120
Boötis (172.1907)	**P16**: 56
Boötis (15.1908)	**P16**:510
V *Camelopardalis*	**P10**:442
W *Camelopardalis* (20.1903)	**P11**:398; **P12**: 62
X *Camelopardalis* (22.1903)	**P11**.398; **P12**: 62
Y *Camelopardalis* (21.1903)	**P11**:398, 458; **P12**: 62
Z *Camelopardalis* (183.1904)	**P13**:52; **P14**:181
RR *Camelopardalis* (40.1905)	**P13**:218; **P14**:179
RS *Camelopardalis* (105.1905)	**P13**:514; **P14**:180
RT *Camelopardalis* (34.1906)	**P14**:374, 637
RU *Camelopardalis* (2. 1907)	**P15**:255, 512; **P16**:120
RV *Camelopardalis* (7.1907)	**P15**:185; **P16**:120

Volume and Page

Variable stars, New, *(Continued)*
RW *Camelopardalis* (39.1907) **P15**:442; **P16**:182
RX *Camelopardalis* (40.1907) **P15**:442
— *Camelopardalis* (41.1907) **P15**:442
— *Camelopardalis* (57.1908) **P16**:652
— *Camelopardalis* (58.1908) **P16**:652
Y *Cancri* (3.1904) **P12**:210
— *Cancri* (151.1907) **P16**: 55
U *Canis Majoris* (189.1907) **P16**:248
V *Canis Majoris* (193.1907) **P16**:248
— *Canis Majoris* (150.1907) **P16**: 55
— *Canis Majoris* (194.1907) **P16**:248
— *Canis Majoris* (195.1907) **P16**:248
Canis Venatici (138.1907) **P15**:640
Canis Venatici (140.1907) **P15**:640
RU *Capricorni* (99.1901) **P10**:442, 444
RV *Capricorni* (108.1905) **P14**:58, 637
RY *Carinae* (98.1901) **P10**:442, 444
SS *Carinae* (73.1906) **P14**:434, 637
ST *Carinae* (158.1906) **P16**:120
— *Carinae* (5.1906) **P15**:185
— *Carinae* (152.1907) **P16**: 55
(157.—192.1906) **P15**:185
Y *Cassiopeiae* (1898) **P6**:55, 118
Z *Cassiopeiae* (1898) **P7**:94, 160, 215
RR *Cassiopeiae* (5.1900) **P13**:518
RS *Cassiopeiae* (108.1904) **P12**:497; **P15**:512
RT *Cassiopeiae* (160.1904) **P12**:677
RU *Cassiopeiae* (186.1904) **P14**:179
RV *Cassiopeiae* (41.1905) **P13**:274; **P14**:179
RW *Cassiopeiae* (46.1905) **P13**:338; **P14**:179, 497
RX *Cassiopeiae* (6.1904) **P12**:279; **P14**:496, 636
RY *Cassiopeiae* (28.1906) **P14**:304, 637; **P15**:380, 512
RZ *Cassiopeiae* (77.1906) **P14**:636
SS *Cassiopeiae* (64.1905) **P16**:120
ST *Cassiopeiae* (155.1906) **P15**:184; **P16**:120
SV *Cassiopeiae* (194.1906) **P15**:255; **P16**:122
SW *Cassiopeiae* (65.1907) **P15**:443; **P16**:121, 182
SX *Cassiopeiae* (142.1907) **P16**:55, 321
— *Cassiopeiae* (190.1904) **P13**:157
— *Cassiopeiae* (65.1905) **P16**:120
Cassiopeiae (36.—38.1907) **P15**:442
— *Cassiopeiae* (179.1907) **P16**:123
— *Cassiopeiae* (142.1908) **P16**:651
RX *Centauri* (— 1902) **P10**:442
RZ *Centauri* (141.1906) **P16**:120

Variable stars, New, *(Continued)*

	Volume and Page
SS *Centauri* (149.1906)	**P16**:120
ST *Centauri* (169.1906)	**P16**:120
SU *Centauri* (170.1906)	**P16**:120
SV *Centauri* (177.1906)	**P16**:120
SW *Centauri* (182.1906)	**P16**:120
SX *Centauri* (183.1906)	**P16**:120
SY *Centauri* (190.1906)	**P16**:120
SZ *Centauri* (191.1906)	**P16**:120
TT *Centauri* (11.1907)	**P15**:185; **P16**:120
TU *Centauri* (13.1907)	**P16**:120
— *Centauri* (157.1907)	**P16**: 56
δ *Cephei* (1784)	**P11**:273
X *Cephei*	**P6**:532; **P7**:493
Z *Cephei* (15.1903)	**P11**:345; **P12**: 62
RR *Cephei* (56.1903)	**P11**:511; **P12**: 62
RS *Cephei* (79.1905)	**P13**:471, 571; **P14**:179
RT *Cephei* (185.1904)	**P13**:52; **P14**:180
RU *Cephei* (31.1906)	**P14**:306, 637
RV *Cephei* (32.1906)	**P14**:306, 637
Z *Ceti* (156.1904)	**P12**:625, 677; **P14**:57; **P16**: 56
— *Circini*	**P16**: 56
— *Coeli* (187.1907)	**P16**:248
V *Columbae* (188.1907)	**P16**:248
W *Columbae* (190.1907)	**P16**:248
— *Coma* (1897)	**P5**:270, 436, 556
V *Coronae*	**P12**:496
W *Coronae* (18.1902)	**P11**:50; **P13**:514
X *Coronae* (44.1906)	**P14**:637
Y *Coronae* (16.1907)	**P15**:185; **P16**:120
Z *Coronae* (17.1907)	**P15**:185; **P16**:120
U *Cor Austr.* 92.1901)	**P10**: 45
— *Cor. Austr.* (22.1908)	**P16**:579
— *Cor. Austr.* (24.1908)	**P16**:579
— *Cor Austr.* (36.1908)	**P16**:580
— *Cor. Bor.* (158.1907)	**P16**: 56
— *Cor. Bor.* (173.1907)	**P16**: 56
— *Corvi* (156.1907)	**P16**: 55
V *Crucis* (26.1904)	**P14**:637
W *Crucis* (180.1906)	**P16**:120
X *Crucis* (186.1906)	**P16**:120
RT *Cygni* (1890)	**S9**:232; **P6**:473

SS *Cygni* (1896), **P4**:104; **P5**:47, 110, 271, 328, 386, 557; **P6**:54, 304, 413, 532, 587; **P7**:43, 95, 163, 267, 380, 437, 537; **P8**:46, 100, 158, 287, 343, 459; **P9**:48; **P11**:52, 273; **P12**:496; **P13**: 105.

Volume and Page

Variable stars, New, *(Continued)*
- ST *Cygni* (1898) **P6**:247, 304
- SU *Cygni* (1897) **P15**:119
- SW *Cygni* (1899) **P7**:379; **P9**:518; **P12**:496
- SY *Cygni* (1899) **P8**:158, 215
- TU *Cygni* (13.1900) **P9**: 48
- UU *Cygni* (38.1901) **P13**:514, 518
- UW *Cygni* (78.1901) **P9**:571; **P10**:442
- UX *Cygni* (96.1901) **P10**:100, 442
- UY *Cygni* (1.1902) **P10**:218, 442
- UZ *Cygni* (10.1902) **P10**:385, 442; **P12**:424
- VV *Cygni* (20.1902) **P11**:101, 398; **P12**: 62
- VW *Cygni* (55.1903) **P11**:458; **P12**: 62
- VX *Cygni* (58.1903) **P11**:571
- VY *Cygni* (6.1903) **P12**: 63
- VZ *Cygni* (7.1904) **P12**:280
- WW *Cygni* (154.1904) **P12**:568, 625; **P15**:512
- WX *Cygni* (59.1903) **P11**:510, 572
- WY *Cygni* (164.1904) **P12**:678
- WZ *Cygni* (107.1905) **P14**:57, 180
- XX *Cygni* (14.1904) **P12**:358; **P14**:496, 637
- XY *Cygni* (72.1905) **P13**:412; **P14**:637
- XZ *Cygni* (76.1905) **P13**:412; **P14**:433, 637
- YY *Cygni* (94.1901) **P10**:45; **P13**:156; **P14**:637
- YZ *Cygni* (33.1904) **P16**:121
- ZZ *Cygni* (193.1906) **P15**:254; **P16**:121
- AA *Cygni* **P16**:121
- — *Cygni* (161.1907) **P16**: 56
- W *Delphini* (1895) **P3**:375, 376; **P4**:448; **P13**:518
- Y *Delphini* (15.1902) **P11**:50; **P13**:514
- Z *Delphini* (16.1902) **P11**:50; **P12**:62; **P13**:514
- RR *Delphini* (79.1906) **P14**:439, 569, 637
- RS *Delphini* (20.1907) **P15**:185; **P16**:121
- U *Draconis* (1897) **P5**:556
- — *Draconis* (1.1900) **P8**:215
- W *Draconis* (6.1902) **P10**:442
- X *Draconis* (7.1902) **P10**:442
- Y *Draconis* (2.1903) **P11**:215
- Z *Draconis* (4.1903) **P11**:216, 275, 397, 571
- — *Draconis* (184.1904) **P13**: 52
- RR *Draconis* (188.1904) **P13**:157; **P14**:180; **P15**:119
- RS *Draconis* (39.1905) **P13**:218; **P14**:180
- RT *Draconis* (74.1905) **P14**:180
- RU *Draconis* (75.1905) **P14**:180
- RV *Draconis* (54.1906) **P14**:434; **P16**:120
- RW *Draconis* (87.1907) **P14**:497; **P15**:510, 512; **P16**:120

Volume and Page

Variable stars, New, *(Continued)*

- RX *Draconis* (121.1906) …… **P14**:631; **P15**:119; **P16**:121
- — *Draconis* (— 1906) …… **P15**:185
- RY *Draconis* (10.1907) …… **P15**:312; **P16**:120
- RZ *Draconis* (26.1907) …… **P15**:381, 512; **P16**.121
- SS *Draconis* (47.1907) …… **P15**:442
- ST *Draconis* (182.1907) …… **P16**:182
- SU *Draconis* (43.1907) …… **P15**:442; **P16**:182
  - *Draconis* (43. and 45.1907), *W. E. Sperra* …… **P16**:569
- — *Draconis* (159.1907) …… **P16**: 56
- — *Draconis* (160.1907) …… **P16**: 56
- — *Draconis* (141.1908) …… **P16**:651
- X *Geminorum* …… **P6**:184; **P7**: 42
- Y *Geminorum* (4.1902) …… **P10**:271; **P12**: 62
- — *Geminorum* (7.1903) …… **P11**:273
- Z *Geminorum* (9.1903) …… **P11**:273; **P12**:62; **P13**:514
- — *Geminorum* (12.1903) …… **P11**:274, 339
- RR *Geminorum* (13.1903) …… **P11**:274; **P12**:62; **P15**: 57
- RS *Geminorum* (14.1903) …… **P11**:275; **P12**: 62
- RT *Geminorum* (12.1904) …… **P12**:357
- RU *Geminorum* (15.1904) …… **P12**:422
- RV *Geminorum* (141.1904) …… **P12**:567
- — *Geminorum* (63.1905) …… **P13**:411
- RW *Geminorum* (30.1906) …… **P14**:305, 637
- RX *Geminorum* (49.1907) …… **P16**:248
- — *Geminorum* (1.1908) …… **P16**:182
- RY *Geminorum* (6.1908) …… **P16**:320
- — *Geminorum* (51.1908) …… **P16**:652
- — *Geminorum* (52.1908) …… **P16**:652
- — *Geminorum* (54.1908) …… **P16**:652
- — *Geminorum* (56.1908) …… **P16**:652
- RU *Herculis* …… **P4**:384
- RV *Herculis* …… **P5**:326
- RX *Herculis* …… **P6**:581; **P7**:215, 535
- RY *Herculis* …… **P7**:537; **P8**:45, 158
- SS *Herculis* (77.1901) …… **P9**:515; **P10**:442
- ST *Herculis* (29.1903) …… **P11**:398
- SU *Herculis* (31.1903) …… **P11**:458; **P12**: 62
- SV *Herculis* (162.1904) …… **P12**:678
- SW *Herculis* (3.1907) …… **P15**:313; **P16**:120
  - *Herculis* (174.—177.1907) …… **P16**: 56
- — *Herculis* (20.1908) …… **P16**:579
- — *Herculis* (138.1908) …… **P16**:581
  - *Hydrae* (163. and 164.1907) …… **P16**: 56
- — *Hydrae* (171.1907) …… **P16**: 56
  - *Indi* (196.1907) …… **P16**:248

Volume and Page

Variable stars, New, *(Continued)*
— *Lacertae* **P5**:437
U *Lacertae* (2.1902) **P10**:270, 275, 442; **P13**:514
V *Lacertae* (110.1904) **P16**:123
W *Lacertae* (163.1904) **P12**:678
X *Lacertae* (88.1906) **P14**:497; **P16**:121, 123
Y *Lacertae* (23.1907) **P15**:312, 512; **P16**:121
Z *Lacertae* (132.1907) **P16**:182
RR *Lacertae* (133.1907) **P16**:182
— *Lacertae* (10.1908) **P16**:446
— *Leonis* (13.1904) **P12**:358
X *Leonis* (66.1907) **P16**:120
Y *Leonis* (165.1907) **P16**:56, 510
Z *Leonis* (167.1907) **P16**:56, 510
— *Leonis* (170.1907) **P16**: 56
S *Leonis Minoris* (19.1904) **P12**:423
— *Leonis Minoris* (166.1907) **P16**: 56
— *Leonis Minoris* (169.1907) **P16**: 56
Librae, near 5 Messier, *D. E. Packer* **S9**:381; **S10**:107
X *Lupi* (69.1905) **P16**:120
Y *Lupi* (15.1907) **P15**:185; **P16**:120
S *Lyncis* (1898) **P6**:118, 185, 354
T *Lyncis* (1.1906) **P14**:181, 637
U *Lyncis* (9.1908) **P16**:445
— *Lyncis* (55.1908) **P16**:652
V *Lyrae* (1895) **P6**:354
W *Lyrae* (1896) **P5**:327
Y *Lyrae* (12.1900) **P9**: 49
Z *Lyrae* (15.1900) **P9**: 49
RT *Lyrae* (5.1902) **P10**:329, 442; **P13**:514
RU *Lyrae* (11.1902) **P10**:385, 442
RV *Lyrae* (13.1902) **P10**:439
RW *Lyrae* (17.1902) **P11**:50, 101; **P12**: 62
RX *Lyrae* (10.1903) **P11**:274, 397; **P12**:62, 418; **P13**:514
RY *Lyrae* (17.1903) **P11**:397; **P12**: 62
RZ *Lyrae* (19.1903) **P11**:401, 453; **P12**: 62
SS *Lyrae* (63.1903) **P12**:142, 210
ST *Lyrae* (109.1904) **P12**:497
SU *Lyrae* (59.1905) **P13**:339, 512; **P14**:180
SV *Lyrae* (80.1905) **P14**:180
— *Lyrae* (80.—101.1905) **P13**:512
SW *Lyrae* (81.1905) **P14**:180
SX *Lyrae* (82.1905) **P14**:180
SY *Lyrae* (30.1904) **P16**:121
— *Lyrae* (139.1908) **P16**:651
RR *Monocerotis* (16.1903) **P11**:345; **P12**: 62

Volume and Page

Variable stars, New, *(Continued)*
RS *Monocerotis* (10.1904) **P12**:357
RT *Monocerotis* (42.1905) **P13**:274; **P14**:180
RU *Monocerotis* (43.1905) **P13**:274; **P14**:179; **P15**:512
RV *Monocerotis* (3.1902) **P10**:270; **P16**:120
RW *Monocerotis* (24.1907) **P15**:312; **P16**:120
— *Monocerotis* (149.1907) **P16**: 55
RX *Monocerotis* (7.1908) **P16**:387
T *Muscae* (— 1904) **P14**:180
U *Muscae* (153.1906) **P16**:120
— *Muscae* (153.1907) **P16**: 55
— *Muscae* (155.1907) **P16**: 55
U *Ophiuchi* (1871) Period of **S1**:272
Z *Ophiuchi* (1894) **P1**:324
RT *Ophiuchi* (76.1901) **P12**:62; **P13**:514
RU *Ophiuchi* (18.1904) **P12**:423
RV *Ophiuchi* (136.1904) **P14**:432
RW *Ophiuchi* (158.1904) **P12**:677
RX *Ophiuchi* (60.1905) **P13**:351; **P14**:180
RY *Ophiuchi* (77.1905) **P13**:412; **P14**:180
RZ *Ophiuchi* (103.1905) **P13**:513; **P14**:180, 498, 632
SS *Ophiuchi* (50.1907) **P15**:443; **P16**:120
ST *Ophiuchi* (52.1907) **P15**:443; **P16**:120
SU *Ophiuchi* (53.1907) **P15**:443; **P16**:120
SV *Ophiuchi* (54.1907) **P15**:443; **P16**:120
— *Ophiuchi* (60.1907) **P15**:443; **P16**:120
X *Orionis* (11.1904) **P12**:357
Y *Orionis* (49.1903) **P12**:357; **P13**:157; **P14**:179
— *Orionis* (8.1904) **P12**:280
— *Orionis* (9.1904) **P12**:357, 422
Orionis (168—182.1904) **P13**: 52
Orionis (11.1908) **P16**:446
Orionis (50.1908) **P16**:652
Orionis (53.1908) **P16**:652
T *Pegasi* (1863) **P13**:514
U *Pegasi* (1894) **P8**:215
Y *Pegasi* (14.1900) **P9**:49; **P13**:514
RR *Pegasi* (95.1901) **P10**:46, 442
RS *Pegasi* (12.1902) **P10**:385, 442; **P13**:514
RT *Pegasi* (19.1902) **P11**:50; **P12**:62; **P13**:514
RU *Pegasi* (142.1904) **P12**:567
RV *Pegasi* (159.1904) **P12**:677
RX *Pegasi* (70.1905) **P16**:122
RY *Pegasi* (50.1906) **P16**:122
RZ *Pegasi* (51.1906) **P16**:122
— *Pegasi* (162.1907) **P16**: 56

Volume and Page

Variable stars, New, *(Continued)*
- κ *Persei* (74.1901) **P9**:407
- Y *Persei* (68.1901) **P13**:514
- Z *Persei* (14.1902) **P10**:545; **P12**: 62
- RR *Persei* (1.1904) **P12**:205; **P13**:514
- RS *Persei* (16.1904) **P12**:422
- RT *Persei* (155.1904) **P12**:625; **P13**:514
- RU *Persei* (187.1904) **P13**:100; **P14**:179
- RV *Persei* (61.1905) **P13**:411; **P14**:179; **P15**:379, 512
- RW *Persei* (29.1906) **P14**:304, 637
- RX *Persei* (35.1906) **P14**:374, 637
- RY *Persei* (120.1906) **P15**:184, 253, 380; **P16**:120
- RZ *Persei* (156.1906) **P15**:184, 312; **P16**:120
- SS *Persei* (33.1907) **P15**:442; **P16**:120
- — *Persei* (34.1907) **P15**:442
- ST *Persei* (67.1907) **P16**:182
- SU *Persei* (35.1907) **P15**:442
- SV *Persei* (73.1907) **P16**:182
- SW *Persei* (2.1908) **P16**:182
- — *Persei* (17.1908) **P16**:510
- Novae, 1 and 2, (See *Persei*, Novae)
- U *Phoenicis* (184.1907) **P16**:248
- — *Phoenicis* (197.1907) **P16**:248
- — *Phoenicis* (198.1907) **P16**:248
- T *Pictoris* — **P16**:120
- Z *Puppis* (1897) **P7**: 42
- RV *Puppis* (192.1907) **P16**:248
- U *Sagittae* (93.1901) **P10**:45, 157, 215; **P13**:518
- V *Sagittae* (21.1902) **P11**:102; **P12**: 62
- W *Sagittae* (46.1906) **P14**:637
- Nova *Sagittarii* (1899) **P7**:266
- V *Sagittarii* (165.1904) **P13**: 51
- SV *Sagittarii* (30.1903) **P11**:398
- SX *Sagittarii* (78.1906) **P14**:439, 637
- — *Sagittarii* (139.1904) **P12**:567
- — *Sagittarii* (23.1908) **P16**:579
  - *Sagittarii* (25.—33.1908) **P16**:579
  - *Sagittarii* (38.—42.1908) **P16**:580
- — *Sagittarii* (140.1908) **P16**:651
- R *Scorpii* (1853) **P4**:275, 331; **P6**:354
  - *Scorpii* 105 in **P13**:156, 219
  - *Scorpii* (18. and 19.1908) **P16**:579
- — *Scorpii* (21.1908) **P16**:579
- U *Scuti* (73.1901) **P15**:512
- V *Scuti* (140.1904) **P12**:567
- W *Scuti* (56.1907) **P16**:121

Volume and Page

Variable stars, New, *(Continued)*
  X *Scuti* (57.1907) **P16**:121
  Y *Scuti* (58.1907) **P16**:121
  Z *Scuti* (61.1907) **P16**:121
    Scuti (34., 35. and 37.1908) **P16**:580
  W *Serpentis* (55.1907) **P16**:120
  S *Sextantis* (42.1906) **P16**:120
  T *Sextantis* (168.1907) **P16**: 56
  S *Tauri* (1855) **P5**:109
  Z *Tauri* (4.1903) **P11**:216
  RS *Tauri* (5.1903) **P11**:216; **P12**: 62
  — *Tauri* (6.1903) **P11**:216
  RT *Tauri* (2.1904) **P12**:210
  RV *Tauri* (45.1905) **P13**:338; **P14**:179
  RW *Tauri* (102.1905) **P13**:512, 513; **P14**:179, 181; **P16**:182
  RX *Tauri* (279.1904) **P14**:637
  SS *Tauri* (178.1907) **P16**:122
    Tauri (46.—48.1908) **P16**:652
  R *Trianguli* (1871) **P15**:443
  U *Tucanae* — **P16**:120
  V *Tucanae* (185.1907) **P16**:248
  — *Tucanae* (183.1907) **P16**:248
  — *Tucanae* (186.1907) **P16**:248
  V *Ursae Majoris* (70.1901) **P13**:514
  W *Ursae Majoris* (3.1903) **P11**:215; **P12**: 62
  — *Ursae Majoris* (8.1903) **P11**:273
  RR *Ursae Majoris* (106.1905) **P13**:514; **P14**:180
  RS *Ursae Majoris* (67.1905) **P13**:571; **P14**:180
  RU *Ursae Majoris* (137.1907) **P15**:640
  RV *Ursae Majoris* (139.1907) **P15**:640; **P16**:247
  RW *Ursae Majoris* (44.1907) **P15**:442
  — *Ursae Majoris* (28.1907) **P15**:381
  — *Ursae Majoris* (28.1907) **P15**:381
  — *Ursae Majoris* (46.1907) **P15**:442
  — *Ursae Majoris* (59.1908) **P16**:652
  T *Ursae Minoris* (57.1903) **P11**:511; **P12**: 62
  U *Ursae Minoris* (113.1904) **P12**:498
  Y *Velorum* (97.1901) **P10**:442, 444
  Z *Velorum* (28.1900) **P10**:442
  RR *Velorum* (91.1901) **P10**:45, 442
  RS *Velorum* (23.1904) **P14**:637
  Nova *Velorum* (154.1906) **P16**:121
  RU *Virginis* (1897) **P13**:514
  RZ *Virginis* (73.1905) **P14**:180
  SS *Virginis* (78.1905) **P13**:470; **P14**:180
  ST *Virginis* (12.1907) **P15**:185; **P16**:120, 651

Volume and Page

Variable stars, New, *(Continued)*
SU *Virginis* (154.1907)........**P16:** 55
U *Vulpeculae* (1897)........**P15:**443
V *Vulpeculae* (4.1904)........**P12:**279
W *Vulpeculae* (5.1904)........**P12:**279
Vulpeculae (143.—153.1904)........**P12:**567
X *Vulpeculae* (161.1904)........**P12:**677
Y *Vulpeculae* (4.1907)........**P15:**313; **P16:**121
— *Vulpeculae* (116.1908)........**P16:**510
North circumpolar, *J. A. Parkhurst*........**P4:**369, 419
Observation of, *E. E. Markwick*........**P12:**193
P. S. Yendell........**P2:**12, 95; **P13:**453; **P14:**537, 596
at Hamburg, *H. Graff*........**P13:**514
R. O' Halloran........**P10:**271
Observations and notes: (For discoveries and elements see New Variable Stars)
Algol **P16:** 56
S *Antliae* (1888)........**P12:**498
ε *Aurigae* — **P12:**142
U *Aurigae* (1891)........**P10:**273
W *Aurigae* (1898)........**P11:**53, 401; **P14:**120
V *Boötis* (1884)........**P14:**503; **P15:**512
Y *Camelopardalis* (21.1903)........**P16:** 57
U *Cassiopeiae* (1887)........**P16:**125
W *Cassiopeiae* (1894)........**P16:**125, 254
RZ *Cassiopeiae* (77.1906)........**P16:** 57
Radial motion of........**P15:** 57
o Ceti, Mira, *J. A. Parkhurst*........**P3:**165; Cor. **P3:**208
Charts of **P6:**126
Maxima of, *R. O'Halloran*........**P5:**55; P6:586; **P7:**437, 544
Notes........**S5:**92; **P3:**262, 380, 390; **P6:**413; **P7:**215
Observations, *F. Bradbury*........**P3:**262
D. Flanery **P3:**262
D. Hadden........**P6:**55; **P7:**105; **P8:**219
R. O'Halloran, **P3:**384, 440; **P4:**334; **P6:**56, 126, 255, 586; **P7:**223, 544; **P15:**381; **P16:**123.
H. C. Wilson........**P3:**150, 261, 390
Spectrum of, *H. C. Wilson,*........**P3:**390
in *Cetus* suspected........**S1:** 70
V *Coronae*........**P11:**400; **P12:**496; **P14:**121, 502; **P15:**512
S *Cygni* (1860)........**P14:**121
X *Cygni* (1886)........**P11:** 50
SS *Cygni* (1896)........**P11:**400; **P14:**121
(See *Cygnus*)
TX *Cygni* (22.1900), Period of........**P10:**215

	Volume and Page
Variable stars, Observations and notes, *(Continued)*	
UY *Cygni* (1.1902)	P11:333
RR *Delphini* (79.1906)	P16: 57
U *Draconis* (1897)	P11:400
Z *Draconis* (4.1903)	P16: 57
Comparison stars for, *M. W. Whitney*	P11:428
U *Geminorum* (1855)	P6:117, 248, 303; P7:266; P8:158, 287; P11:96; P12:280; P13:106; P14:503; P15:382.
RW *Geminorum* (30.1906)	P16: 57
R *Hydrae* (1670)	P12:497; P13:469
V *Hydrae* (1888)	P11:217; P12:497; P13:470
T *Lacertae*	P5:437
R *Leonis* (1782)	P15:382
β *Lyrae* (1784)	P6:117
V *Lyrae* (1895)	P11:398
W *Lyrae* (1896)	P11:216, 399; P13:105, 470; P14:502
RZ *Ophiuchi* (103.1905)	P15:641
α *Orionis* (1840), Spectrum of	P8: 46
Variability of	P11: 51
U *Orionis* (1885)	P10:272
V *Orionis* (1887)	P10:272; P12:496; P13:469; P14:121
Z *Persei* (14.1902)	P16: 57
RY *Persei* (20.1906)	P16: 57
LL *Puppis* (1872)	P10:273
S *Saggittae* (1885)	P13:411
R *Tauri* (1849)	P10:273; P11:399; P15:513
S *Tauri* (1855)	P10:271; P11:399
R *Ursae Majoris* (1853)	P10:273
V *Ursae Majoris* (70.1901)	P12:423
β *Ursae Minoris*	S1:130
X *Virginis* (1871)	P11:401
Y *Virginis* (1874)	P13:469
Photographic magnitudes of	P6:532
Plan for observing, *E. C. Pickering*	S1:237; S2: 25
Relation between color and period of	P16:322
of short period, *E. C. Pickering*	P6:262
W. E. Sperra	P3:404
P. S. Yendell	P2:160, 202, 269, 362
Revised list of, *H. C. Wilson*	P14:75, 255
Wilson's list of Algol, *F. H. Seares*	P14:238
Vatican observatory, *W. A. Parr*	P11:497
Vectors, Simple application of, *A. B. Turner*	P16:408
Velocity curve of α *Carinae*	P15:645
θ *Draconis*	P15:646
ω *Draconis*	P15:647
α *Pavonis*	P15:645

Volume and Page

Velocity curve of, *(Continued)*
        κ *Velorum* **P15**:646
    in line of sight, Unit of, *E. B. Frost* **A8**:160
    of stars determined by spectrograph, *H. C. Vogel* **A1**:203
Venus, *P. Lowell* **P12**:184
    M. Winger **P4**:530
    near inferior conjunction, *E. E. Barnard* **S10**: 43
    observations, *A. E. Douglass* **P6**:253
        A. R. J. F. Hassard **P16**:459
        R. Sprague **P2**:287
    Ring of light around, *J. A. Brashear* **S1**:263
        Z. Daniel **P15**:516
        J. E. Keeler **S1**:292
        H. N. Russell **P15**:516
    Rotation period of gravitation, *W. H. S. Monck* **P5**:168, 273
        T. J. J. See **P5**:224
        studied spectrographically, *P. Lowell* **P11**:426
        and surface, *P. Lowell* **P4**:281, 389; **P11**:518
    Supposed satellite of, *H. C. Wilson* **S6**:357
    Terminator of, *W. Wetherbee* **P12**: 67
        Note **P8**:237
    Transit of, (1882), *E. E. Barnard,* **S1**:290; *E. Frisby,* **S1**:182; *W. Harkness,* **S1**:143; *C. S. Hastings,* **S1**:273; *E. L. Larkin,* **S1**:294; *C. A. Young,* **S1**:300.
        Notes on, **S1**:128, 134, 143, 153, 182, 191, 193, 230, 260-5, 268-70, 290, 294, 299, 312-14; **S2**:27, 237.
    and Jupiter in conjunction, *L. G. Léon* **P11**:160
γ Virginis, Orbit of, *Dr. Dorberck* **P4**:162
Vision, Limit of, *H. P. Tuttle* **S8**:302
Volcanic dust? Is it Pelee **P10**:446
"Vulcan" in 1860, Search for, *H. P. Tuttle* **P7**:235
U *Vulpeculae* and ST *Cygni, E. C. Pickering* **S7**:208
Watson's twenty-two asteroids **P12**:429, 645
Wave-length of light, Standard, *A. A. Michelson* and *E. W. Morley* **S8**:241, 278; **S10**:251
        H. A. Rowland ...... **A2**:321; Cor. **A2**:563
Wave-lengths hitherto unrecognized **S5**:278
Weather indications along eclipse path, 1900, *F. H. Bigelow* **P7**:451
Webb, Thomas William, *A. Mee* **P13**:138
Whitin observatory of Wellesley college, *S. F. Whiting* **P8**:482
Wind forces on an observatory dome, *E. D. Roe, Jr* **P14**:347; **P16**:424
Winds and refractors **A2**:573, 762
Wire-intervals for transit instrument, *W. H. M. Christie* **P15**:302
Wolf-Rayet stars, *W. W. Campbell* **A3**:448
        in *Cygnus, Mr. and Mrs. W. Huggins* **S10**: 49
        Nebulosity about **A1**:236

	Volume and Page
World's congress auxiliary, *G. W. Hough*	A1:462
Yarnall's catalogue	S6: 81
Yerkes observatory, *W. W. Payne*	P5:115, 340; P14:458, 527
receives Bruce telescope	P12:363
telescope, *W. W. Payne*	A2:571; P1:176
Zenith tube, Wharton reflex, *E. Doolittle*	P14:530
Zodiacal light *A. K. Bartlett*	P10:179
Color of, *E. W. Maunder*	P6:307
Early observations of	P4:107
Northern limit of, *E. A. Fath*	P16:633
Note on	A2:599
Photographs of, *A. E. Douglass*	P8:174; P9:190
and gegenschein	P10:276
Milky Way, compared	P16:589
stars for 1900-1902, Catalogue of	P16:195
Zone observations	S1:63, 67; S3:152